THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Each week is adding to the tonnage of business on the books of furnaces and rolling mills for delivery in the second half of the year. Many foundries are still holding back on purchases for the last six months, as in many cases contracts for castings for such delivery will not be placed for several months, and it does not appear thus far that there will be any such precautionary and speculative advance buying as was seen in 1899. The week has accented the activity in steel works and rolling mill products and several developments in this connection are significant. The inability of American rail mills to bid on Mexican business has been mentioned heretofore. It is now stated that a Southern railroad is about to place an order for 30,000 tons of rails with a foreign mill, because it cannot secure needed deliveries from mills at home. Foreign makers are keen for the business and it is understood have quoted a delivered price of $28, which, deducting duty and freight, would net the mill considerably less than $20. Further commentary on the condition of the large steel interests is found in pending negotiations for 20,000 tons of German speigeleisen, which is offered at $26, Pittsburg. This follows the purchase of a round lot of German spiegel in December and indicates the pressure upon blast furnaces of the steel companies. Importations of steel continue, and a Canadian works has made a sale of 3,000 tons of billets for Pittsburg. German billets are higher, in view of the demand for this side, as well as the general improvement in the German iron trade. The spread between Bessemer steel and Bessemer iron is increasing and with finished products maintained on a level the profits of independent finishing mills are lessened. This condition and the general problem of steel supply were considered by independent sheet producers at Pittsburg on Monday, all but two or three of the mills being represented. Another meeting is to be held next week. The condition of the structural mills is shown in the advance of $4 a ton made by the Passaic and Phoenix companies, though the agreed price of 1.60c, Pittsburg, is still maintained by the larger interests. The mills are unable to accept business for delivery before July 1 and new work is constantly coming forward. No slacking appears in the demand for bars. At Pittsburg 30,000 tons of steel bars were sold the past week, the advance in bar iron stimulating the demand for steel. Wire nail manufacturers advanced their price last week 5 cents a keg and wire has been advanced $1 a ton. The reports from bridge and locomotive and car works show that their present scale of operations will continue well into the second half of the year if no further orders are taken. The leading pig iron markets report active contracting in the past week. At Cincinnati basic and car wheel irons have been well bought; at Chicago foundry and malleable grades. Pittsburg reports 15,000 tons of Bessemer sold at $16 at furnace, though as high as $16.50 was paid on small lots. Basic is quoted at $16 at furnace for the second half and gray forge at $15.50 at Valley furnace for the same delivery. A 50-cent advance has been made by Eastern furnacemen to a basis of $16.50 at Lehigh Valley furnace for No. 2 foundry iron.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Feb. 5.

Owing to the inability of the rail mills to make deliveries on rails short of next December, an order for 30,000 tons of standard sections is this week being offered to foreign manufacturers by a large Southern road and it is probable that the contract will be closed before the end of the week. Owing to the low prices existing abroad rails can be imported, duty paid, at about $28 per ton, Baltimore, which is the same price quoted by the domestic mills. This is the first order for rails to be sent abroad by any of the railroads of this country since the scarcity of steel became so pronounced, and it is altogether probable that it will be followed by others from roads that have not yet succeeded in covering their requirements.

On the other hand, the German steel producers have advanced the price of billets $1.25 to $1.50 per ton and sheet bars have been advanced $2 per ton. The German steel producers knowing of the scarcity of raw material in this country concluded to advance the price for export, but as yet they have failed to sell any of their product in this district at the advanced prices. In the East, however, the delivered price will still be a little less than that asked for domestic steel. As the result of these advances steel billets cannot be landed in New York or Baltimore, duty free, for less than $28.75 per ton, or about $31 Pittsburg, while sheet bars cannot be landed at Atlantic ports for less than $29.25, making the Pittsburg price about $31.50, which is about the same that is asked for sheet bars of domestic make. Whether the mills in this country in need of raw material, especially those in this district, will be compelled to pay the advanced prices asked by the German manufacturers remains to be seen, and depends altogether on their ability to secure domestic material.

The Hamilton Iron & Steel Co. of Hamilton, Ont., is offering small lots of open-hearth billets in this district at about the price quoted by domestic manufacturers, and we note the sale of 3,000 tons during the past week at a price equivalent to $28.50, Pittsburg. Not even during the boom period of 1899 was there such a spread between Bessemer iron and billets as at the present time, and there is every indication of still higher prices unless some relief is afforded; but this is not forthcoming from the large steel producers, as they have not enough steel to supply their own demands.

That all the steel producers are operating their furnaces at their utmost capacity is evident from the fact that little if any ferro-manganese and spiegeleisen is being produced at the present time, the furnaces operating on basic and Bessemer iron. Today an offer of 20,000 tons of spiegeleisen of German manufacture was made to one of the large steel producers at $26 per ton, and it is probable that this lot, or at least a part of it, will be accepted. This quotation is for Pittsburg delivery.

The meeting of the independent sheet manufacturers which was held here on Monday was well attended. No definite action was taken nor was an organization perfected owing to the absence of several representatives who were unable to attend. The next meeting will be held within two or three weeks in this city, when it is believed some definite action will be taken towards forming an organization and taking united action on trade conditions.

At the meeting of the wire and wire nail manufacturers held last week in Chicago the price of nails was advanced 5 cents

per keg. Advances of $1 per ton were also made on plain wire, galvanized wire, polished and galvanized staples, and painted and galvanized barb wire. At a meeting of the cut nail manufacturers held on Feb. 1 the price of cut nails was reduced 10 cents a keg. It is stated that during the past year the production of wire nails was increased 15,000 kegs per day, while the daily output will further be increased 5,000 kegs per day when the mills now under construction are placed in operation.

The Passaic rolling mill at Paterson, N. J., and the Phœnix mills at Phœnixville, Pa., have advanced the price of structural material $4 per ton. This action was taken independent of other mills, the agreed prices remaining unchanged. Why this action was taken by these smaller mills is not altogether clear, unless it is that they have practically sold their output for the balance of the year and do not care to take on additional business.

The meeting of the steel bar manufacturers held last week no doubt stimulated the buying of steel bars for future delivery as contracts running through the next six months and even until next January, covering 30,000 tons, have been closed since it was held.

The finished market continues strong in every department, while the pig iron market continues to show great strength. Efforts are now being made by furnacemen to hold pig iron stationary and they have been fairly successful.

Pig Iron.—Sales of Bessemer iron in the week for prompt delivery and for delivery during the second quarter amounted to nearly 15,000 tons. Small lots brought as high as $16.50 and $16.75 at the furnace, while the larger lots for delivery in the second quarter were sold at $16.75, Pittsburg. Little forge iron is being sold for prompt delivery for the reason that little is to be had, but for the second half of the year furnaces are offering to take business at $16.25, Pittsburg. Foundry irons continue to show great strength, and we note the sale of one lot of 500 tons for delivery within the next two months at $17.50, Pittsburg. For delivery through the second half of the year a sale was made of 2,000 tons of No. 2 foundry at $16.75. There has been little doing in basic iron for delivery the first half of the year owing to its scarcity. For delivery the second half we have been advised that furnacemen are offering their outputs at $16.75 per ton, Pittsburg. The supply of coke is not increasing to any great extent at the furnaces in this district, or the two Valleys, and during the past two days deliveries were particularly bad. But as yet none of the furnaces have been compelled to bank. We make the following quotations:

Bessemer, Valley	$16 00 to 16 75
Bessemer, Pittsburg	16 75 to 17 50
No. 1 Foundry	17 25 to 17 50
No. 2 Foundry	16 75 to 17 25
No 3 Foundry	16 25 to 16 50
Gray Forge, Pittsburg	16 00 to 16 50
Chilled Basic, Valley	16 25 to 16 50
Chilled Basic, Pittsburg	17 00 to 17 25

Steel.—Domestic steel is not growing any more plentiful and all offerings of small lots for prompt delivery are speedily taken by independent finishing mills. We note the sale of 500 tons of Bessemer billets for delivery within the next six weeks at $28.50, Pittsburg; also the sale of several smaller lots at $28.50 at Johnstown. The prevailing quotation for small lots is $28 at mill, Wheeling, Johnstown or Youngstown. Open-hearth billets are quoted at an advance of $1 per ton and sheet bars at $31.50 to $32 per ton. Steel rods for prompt delivery are exceedingly scarce and command $35 per ton.

Ferro-Manganese.—Domestic manganese is quoted at $52.50 per ton at buyer's mill, for 80 per cent. We have been advised that foreign manganese cannot be delivered here for less than $51 per ton, and there have been practically no sales during the past two weeks.

Spelter.—The spelter market rules much easier and prices are considerably lower. We quote prime western grades at 4.10c to 4.12½c.

Muck Bar.—We note the sale of 1,000 tons of muck bar at $30 per ton.

Skelp.—A good demand continues for skelp. We quote steel grooved skelp at 1.70c and sheared at 1.75c. Iron skelp is held respectively at 1.80c to 1.85c.

Rails and Track Material.—That railroads having failed to contract for their supplies of rails for delivery this year will be forced to patronize foreign manufacturers is already apparent. One order for 30,000 tons is now being offered foreign manufacturers and will probably be closed up shortly. The domestic mills have practically all the business they can handle this year. We continue quotations as follows: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; carlots and less than 200 tons, $30; less than carlots, $32; light rails, 8 pounds, $42; 12 pounds, $38; 16 pounds, $35; 20 pounds, $34; 25 to 40 pounds, $32. Track material: Spikes, 2c to 2.05c; track bolts, square heads, 2.50c; hexagon heads, 2.65c; fish plates, 1.60c.

Plates.—The demand for plates continues to grow daily and nearly all the mills in this district have about a month's business ahead of them. The market continues firm at unchanged prices. We make the following quotations: Tank plate, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c; and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

Pipes and Tubes.—The month of January was a record breaker so far as new business in merchant pipe is concerned. There is every indication that February will also show up well. While concessions are being made here and there by independent mills they are not being met by the largest producer, inasmuch as there is enough business to go around without making concessions. Discounts to consumers in carload lots are as follows:

MERCHANT PIPE.

	Blk. Per cent.	Galvd. Per cent.
⅛ to ⅜ and 11 to 12 inches	61	48
½ to 10 inches	68½	56

BOILER TUBES.

Steel.

	Per cent.
1 to 1¾ inches	47½
2¼ to 5 inches	65½
1¾ to 2¼ and 6 to 13 inches	60

Iron.

	Per cent.
1 to 1¾ and 2½ inches	43½
1¾ to 2¼ inches	43
2¾ to 13 inches	53

CASING.

	S. and S. Per cent.
2 to 3 inches	58
3¼ to 4 inches	63
4¼ to 12¾ inches	65

Bars.—During the past week contracts calling for about 30,000 tons of steel bars were closed by mills in this territory. The large demand for steel bars was largely due to the advance in iron bars, many of the former users of iron bars buying the cheapest product where it serves their purpose as well. We make the following quotations: Iron bars 1.60c, Pittsburg, with full freight added to point of delivery; refined iron bars, 1.75c and upwards; Bessemer steel bars, 1.50c; open-hearth, 1.60c; plow beams and cultivator beams, 1.50c, net; channels, angles, zees and tees, Bessemer under three inches, 1.60c; over 3 inches, 1.70c. Hoops and bands are quoted at 1.90c, full extras.

Sheets.—A good demand for sheets has set in during the past ten days and the mills of the American Sheet Steel Co. as well as the independent producers are full of orders. The situation is one that can hardly be explained, the demand coming apparently from all branches of industries using sheets. We note sales of carload lots of black sheets No. 28 gauge at 3.15c, while as high as 3.20c has been paid for fairly good shipment. The mills of the American Sheet Steel Co. continue in full operation and on the heavy grades are unable to make deliveries in less than two or three months. Our quotations to consumers are as follows: Nos. 10 and 12, 2.40c to 2.50c; 14 and 15, 2.50c to 2.60c; 16, 2.60c; 18, and 20, 2.70c to 2.80c; 22 and 24, 2.80c to 2.90c; 26, 2.90c to 3c; 17, 3c to 3.10c; 28, 3.10c to 3.20c; 29, 3.25c to 3.35c; 30, 3.35c to 3.45c. Galvanized sheets are quoted at 70 and 5 and 75 off in carload lots; less than carload lots, 70, and 70 and 5 off.

Structural Material.—The Passiac and Phænix rolling mills, which supply eastern markets, have notified the trade of an advance of $4 per ton on structural material. This advance has not been made by the larger mills, the agreed prices continuing as follows: Beams and channels, 3 to 15

inches; 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

WIRE AND WIRE NAILS.—At a meeting of the wire and wire nail manufacturers, held last week in Chicago, all products were advanced $1 per ton. Wire nails in carload lots are quoted at $2.05 per keg, while smaller lots are held at $2.10 to $2.15; plain wire $2 in carload lots and $2.10 in less than carload lots to retailers; galvanized wire $2.40 in carload lots; polished staples $2.20 and galvanized staples $2.60; painted barb wire $2.60 and galvanized $2.90. These prices are quoted on a Pittsburg base plus the actual freight to destination. Cut nails have been reduced 10 cents per keg and are held at $1.95 in carload lots and $2 in less than carload lots, Pittsburg, plus freight to destination.

MERCHANT STEEL.—Demand for merchant steel continues strong in all its branches. We revise quotations as follows: Shafting, turned, cold rolled and round, 60 per cent off in carload lots and 50 to 55 off in less than carload lots; tire steel, 1.70c in carload lots and 1.80c in less than carload lots; toe calk, 1.95c to 2.05c; sleigh shoe, 2c to 2.25c; machinery steel, 1.50c; smooth machinery steel, 1.75c. Tool steel, 7 cents and upwards.

OLD MATERIAL.—Steel rails for re-rolling purposes are bringing fancy prices and we note the sale of 1,500 tons of standard sections at $23 per ton, gross, Pittsburg. Relaying rails are also commanding from $25 to $26 per ton and are in big demand. Our quotations, gross tons, are as follows: Heavy melting stock, $17.25 to $17.50; steel rails, $17 to $17.25; busheling scrap, $13.50 to $14; No. 1 wrought, $18 to $18.50; iron rail, $22.50 to $23; cast borings, $9 to $9.25; cast scrap, $15.75 to $16.

COKE.—For the week ending Saturday, Jan. 25, the production of the Connellsville region amounted to 208,057 tons, an increase of 637 tons, as compared with the production of the previous week. Connellsville furnace coke is held at $2.25 per ton and foundry at $2.75. Outside cokes bring about 25 cents per ton less.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
634 MONADNOCK BLOCK, Feb 4.

Conditions remain relatively the same in all branches of the iron and steel trade in this section, as have existed for some weeks past. The insistent demand for material continues undiminished, and the capacity of mills and furnaces appears inadequate to meet the requirements of consumers, many of whom are compelled to go to new sources of supply. This is true with regard to all kinds of finished product, as well as all grades of pig iron, and premiums of $1 to $3 a ton are paid to secure shipment within a reasonable time. Usually January and February are quiet months, but all precedents have been set aside this year, and the heavy buying that characterized the month just closed indicates that some buyers are dwelling on the possibility of higher prices and delayed shipments in the future. Another large manufacturer of structural steel has withdrawn from the market, and with the exception of a few sizes of heavy sections of beams, no material of this kind can be had in this territory for delivery prior to July 1. All structural mills are from 60 to 90 days behind in deliveries, and the anomaly was presented last week of an Eastern mill endeavoring to place a large order for steel shapes with a local jobber. Steel bars have felt the stimulus given to the market by the recent advance of $2 a ton in the price of bar iron, and a number of sales are reported at 1.75c, though the old price was reaffirmed last week. All the local bar iron manufacturers are sold for three and four months ahead, and on steel bars the leading local seller of bars has been for some time sold up for the first half of the year.

The independent wire and wire nail manufacturers held a meeting at the Auditorium, Thursday, Jan. 30, and it was agreed to advance prices five cents on nails, nail wire, staples and barb wire, making the carload price of nails to jobbers $2.20.

The buying of pig iron in the past week has been very active mostly for delivery in the third quarter, and included orders for foundry grades ranging from 1,000 tons to 10,000 tons. A good business was also done in malleable pig iron, which is scarce and for which there is a lively demand. A number of good sized inquiries are still in the market, one for 15,000 tons, which it is expected will be closed this week. The scrap iron market is firm and dealers report a scarcity of material.

PIG IRON.—The effects of the coke famine which demoralized the pig iron market for the last three months are still felt in the extraordinary demand for spot iron, which keeps up, notwithstanding the fact that for several weeks it has been well nigh impossible to get any in this market. Foundrymen willingly pay $19 for spot malleable iron, and spot forge commands $15.50 a ton. There is a lively demand for both these grades of iron for prompt shipment, and during the past week there has been active buying, mostly for delivery in the third quarter, however. Large sales are also reported in foundry grades, contracts ranging from 1,000 to 10,000 tons. The buying in the past week has been active in all grades, and the aggregate tonnage closed is very large. The shipments of coke improve daily, and the receipts are sufficient to meet immediate needs. There are several large inquiries for iron still pending, and the indications point to a heavy tonnage being closed this week. We have advanced our prices on Lake Superior charcoal, malleable Bessemer and coke Bessemer and quote as follows:

Lake Sup Charcoal	$20 00 to $21 00	Southern No. 1 Soft	$16 15 to 16 40
Local Coke Fdy. No. 1	16 00 to 16 50	Southern No. 2 Soft	15 55 to 15 90
Local Coke Fdy. No. 2	15 50 to 16 00	Southern Gray Forge	14 65 to 14 90
Local Coke Fdy. No. 3	15 00 to 15 50	Southern Silveries	16 65 to 17 65
Local Scotch Fdy. No. 1	16 00 to 16 50	Jackson Co. Silveries	17 00 to 17 50
Local Scotch Fdy No. 2	15 50 to 16 00	Ohio Strong Softeners	17 50 to 18 00
Southern Coke No. 1	16 40 to 16 65	Alabama Car Wheel	20 50 to 21 00
Southern Coke No. 2	15 65 to 15 90	Malleable Bessemer	18 50 to 19 00
Southern Coke No. 3	15 15 to 15 40	Coke Bessemer	18 50 to 20 00
Southern Coke No. 4	14 65 to $14 90		

BARS.—Mills report no diminution in the volume of business and trading has resolved itself into a question of supply. All the local bar iron manufacturers are sold up for three and four months, and on steel bars a large local seller has been out of the market for several weeks. Though the minimum prices on steel bars has not been advanced, a number of sales have been closed at 1.75c. For quick shipment, premiums of $2 and $3 a ton have been paid for some time. Specifications are heavy, and many concerns have exceeded the tonnage in their contracts. Manufacturers are making every effort to keep prices down, but so urgent are the demands of consumers and so willing are they to pay high premiums that some think it quite possible another advance will be made in the near future. We quote iron, 1.75c to 1.85c, Chicago; steel, 1.65c to 1.75c, Chicago; out of store, 2c.

SHEETS.—Mills report that business is plentiful, and that they are getting behind again in shipments. The demand from jobbers is active. We quote No. 27 black from store, 3.40c, and galvanized 70 per cent to 70 and 5 per cent.

STRUCTURAL STEEL.—The contract for the warehouse which will be erected by Hibbard Spencer & Bartlett was let last week, and calls for 3,500 tons of steel shapes and 1,500 tons of castings. Another Eastern mill reports that it can take no further business for delivery in the first half of this year, and from the heavy pressure of the trade the indications are that the mills' capacity for the third quarter will be taken up very soon. All the mills are from 60 to 90 days behind in shipments, and a Pittsburg concern endeavored to place a large order with a local jobber, which it was unable to fill in time. There is a good demand from store for light shapes. We quote mill shipments, carload lots, as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 6x6 and under, 1.75c; over 6x6, 1.85c; plates, 1.75c, base; tees, 1.80c; zees, 1.75 c; lots from store, 2¼c to 3 cents per pound.

RAILS AND TRACK SUPPLIES.—Continued inquiry for standard sections of rails is reported, but generally from roads wanting spring or summer shipment. There is active demand, also, for track supplies, though both the local manufacturers have sold their capacity for several months. We quote as follows: Standard rails, $28; light sections, $34 to $36, according to size; out of store, $40 to $44; splice bars, 1.70c to 1.80c; spikes, 2.10c; track bolts and hexagon nuts, 2.80c to 2.90c, out of store, 2.90c to 3c; square nuts, base, 2.65c to 2.75c; out of store, 2.75c to 2.85c.

BILLETS.—There are some very large inquiries in the market just now, and early deliveries bring good prices. We learn of one sale of open hearth billets on the basis of $35. We quote Bessemer billets, $31 to $33; open hearth, $33 to $35.

MERCHANT STEEL.—There is an increased inquiry for material wanted in the last half of the year, and some good sized sales are reported. Specifications against contracts are also heavy. We quote mill shipments, Chicago delivery, as follows: Smooth finished tire steel, 1.85c to 2c; open hearth spring steel, 2.25c to 2.50c; sleigh shoe, 1.65c to 1.80c, flat sizes; concave and convex, 2c; cutter shoe, 2.40c to 2.60c; machinery steel, 2.15c to 2.25c, base; plow steel, 2.50c and upwards, according to quality; toe calk out of stock, 2.40c to 2.60c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 per cent to 10 per cent higher; cold rolled shafting, carload lots, 57½ off, Chicago; less than carload lots, 55 to 55 and 5 off, Chicago.

PLATES.—New business is of fair proportions, but not in such volume as to prevent the local mill from handling current specifications. The scarcity of structural is probably responsible, in a measure, for the light tonnage that is being booked. Our quotations follow: Tank steel, base, ¼-inch, 1.75c to 1.85c; flange steel, 1.90c to 2c; marine steel, 1.95c to 2.10c; firebox steel, ordinary, 2c to 2.10c; special, 2.25c and upwards. Jobbers are selling from store according to size, as follows: Tank steel, 1.90c to 2c; flange steel, 2.10c to 2.25c; marine steel, 2.40c to 2.50c; firebox steel, ordinary, 2.40c to 2.50c; special, 2.50c and upwards.

CAST IRON PIPE.—The local interest reports that orders are being booked daily, mostly for small lots. Municipalities, however, do not begin to place contracts for pipe until the advent of spring, and an active market is not expected for several weeks. Prices are firm. We quote as follows: 4-inch water pipe, $29; carload lots, f. o. b. Chicago; 6-inch water pipe, $28; 8-inch and larger sizes, $27; gas pipe, $1 per ton higher than above prices.

MERCHANT PIPE.—Each day brings an improvement in the inquiry for both merchant pipe and boiler tubes. There has been a disposition in certain quarters to cut prices on pipe, but as the low quotations are usually from concerns unable to handle a large tonnage, consumers have had to place their contracts elsewhere and pay the quoted prices. Our quotations follow:

MERCHANT PIPE, RANDOM LENGTHS.

	Black Per cent.	Galv. Per cent.
¼ to ⅜ and 11 to 12 in	59.5	46.5
½ to 10 inches	67	54.5

BOILER TUBES.

	Steel Per cent.	Iron Per Cent.
1 to 1¼ in	40	35
1¾ to 2¼ in	47½	37½
2½ to 5 in	57½	47½
6 in. and larger	45	40

WIRE AND WIRE NAILS.—At a meeting of wire and wire nail manufacturers, held at the Auditorium Hotel, January 30, it was decided to advance prices on nails, smooth wire, staples and barb wire, five cents. The local interest reports there is no lessening in the heavy volume of business that they have booked all winter. We quote prices as follows: Painted barb wire, carload lots, $2.75; galvanized barb wire, in carload lots, $3.05; wire nails, carload lots, $2.20; staples, carload lots, $2.30; jobbers'; prices to retailers, 15 cents higher than above for carload lots, and 20 cents for less than carloads.

COKE.—The supply grows larger each week, and while sufficient to meet immediate needs does not permit the accumulation of any stocks. Spot coke commands from $5.50 to $6.50 a ton, and contracts for future delivery are booked on the basis of $5 to $5.25.

OLD MATERIAL.—The market is very firm, and dealers report a scarcity of material. Most of the local mills have large stocks in their yards, and with the exception of a few special grades, are not buying heavily. The following are approximate prices in gross tons:

Old iron rails	$21 50 to $22 50	Relaying rails	27 00 to 28 00
Old steel rails, 5 ft. and up	21 00 to 21 50	Old wheels	$17 00 to $17 50
Old steel rails, mixed	14 50 to 15 00	Heavy melting steel	14 50 to 15 00
		Mixed country steel	10 50 to 11 00

The following are selling prices per net ton:

No. 1 R. R. wrought	$16 00 to $16 50	Steel Axles	$18 50 to $19 00
No. 2 R. R. wrought	14 00 to 14 50	Cast borings	6 00 to 6 50
Dealers' forge	13 50 to 14 00	Wrought turnings	11 00 to 11 50
No. 1 busheling	11 00 to 11 50	Iron axle turnings	12 00 to 12 50
No. 1 R.R. & mach. cst.	12 25 to 12 75	Steel axle turnings	12 00 to 12 50
Railway malleable	12 00 to 12 50	Stove plates	8 50 to 9 00
Country malleable	11 50 to 12 00	Old iron splice bars	16 50 to 17 00
Iron axles	21 50 to 22 00		

CLEVELAND

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Feb. 5.

The sale of ore has gone on steadily in the past week and Bessemer and non-Bessemer grades have been taken liberally. Of the old range Bessemer product comparatively little remains to be placed. Sellers of non-Bessemer ores have already disposed of from one-half to two-thirds of their estimated production in 1902 and it is stated have secured advances averaging with most of them 25 cents above the level of prices in 1901. The Mesabi producers, whose ores have been so well appreciated by furnacemen that upwards of 60 per cent—in some cases 80 and 90 per cent—of the mixture has been made up of these ores are finding little or no resistance to their advance of 25 cents. The production from this range in 1902 is expected to run to 11,000,000 or 12,000,000 tons, or more than half the total output.

With all the ore sold there has been no vessel chartering in the open market. Vesselmen have argued that the prospect of a repetition of the detentions of last season and the possibility of higher unloading charges justifies them in asking for $1 on season charters from the head of the lake. Among shippers there appears no disposition to consider seriously a higher basis than last season's, namely, 80 cents. It is considered probable that some shippers will tie up a smaller percentage of their ore in season contracts than was placed in advance last season and will trust to mild rates to bring down the average freight on their ore. It is to be expected that the question of season charters will be taken up any day now.

PIG IRON.—Every week emphasizes the short supply of pig iron for delivery in the first half of the year. Sellers of Northern iron are in a number of cases unable to take new business for delivery before July 1, and the available Southern iron is steadily lessening, April and May iron in carload lots being about as difficult to get as iron for February and March. The coke situation has been very trying in the past week, the heavy snowfalls and severe weather making furnace operation very uncertain. Some furnaces have not known in the morning whether they could continue through the day. Every grade of iron is scarce and all furnaces are much behind their delivery schedule. For foundry iron $16 in the Valley now appears to be minimum for No. 2 foundry iron, for delivery in the second half and $16.25 has been done for third quarter iron. A large amount of business is yet to be done for the second half, but it must be said that the prospect of lower prices later in the year does not improve. On the other hand there is a general feeling among producers that advances from the present level should not be made. Basic and forge irons bring high prices for early delivery. The former has been quoted $16 at Valley furnace for the second half, and the latter $15.50 for the same delivery. Bessemer iron has sold as high as $16.50 and $16.75 at furnace in small lots for early delivery, and in round lots for the second quarter at $16 at furnace. We quote the Cleveland market:

Bessemer	$16 75 to $17 50	Scotch No. 1	$17 00 to $17 25
No. 1 Strong F'dry	17 00 to 17 25	Scotch No. 2	16 50 to 17 00
No. 2 Strong F'dry	16 50 to 17 00	Gray forge, Valley	15 50 to 15 75
No. 3 Foundry	16 25 to 16 50	LakeSuperior charc'l	18 00 to 19 00

FINISHED MATERIAL.—Another meeting of steel bar manufacturers has been held this week, but it is understood no action was taken on prices. The sales of the past 10 days in both iron and steel bars have been good, including round lots to jobbers. We quote bar iron, mill shipments, at 1.68½c Cleveland and steel bars, mill shipments, at 1.58½c Cleveland; out of store prices range from 1.75c to 1.85c. Sheets and wrought pipe are still somewhat affected by the season, though there is more activity in sheets in the past week. Prices show that independent mills are sharply after business. The mechanical pipe trade is waiting, with the result that a rush of orders is likely to come at once on the opening of the active season. There are signs in the sheet trade of preparations on the part of jobbers for an active spring business. Mill shipments to consumers are quoted as follows for Cleveland deliveries: No. 24, 2.90c to 3c; No. 26, 3c to 3.10c; No. 27, 3.10c to 3.20c, with usual extras for less than carload lots, etc. Round-lot quotations from store are as follows: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.55c to 2.70c; No. 16, 2.95c to 3.10c; No. 18, 3c to 3.15c;

No. 20, 3.05c to 3.20c; Nos. 22-24, 3.15c to 3.30c; Nos. 25-26, 3.25c to 3.40c; No. 27, 3.35c to 3.50c; No. 28, 3.45c to 3.60c. The above are for one pass through cold rolls. For full cold rolled the extra is .10c. Galvanized sheets are quoted 70 to 70 and 5 off list. The plate market is steady at 1.70c Cleveland for tank. Inquiries on vessel building account seem not to be exhausted, several thousand tons being under inquiry this week. The structural mills are filled for the first half. Indications are that concerns carrying stocks of shapes to be sold after cutting to lengths will have the largest business they have yet known. In this, as well as in other lines, the jobber is getting an increasing business which the mills sought under more sharply competitive conditions, but now find it profitable to turn over to others.

OLD MATERIAL.—The opening of the month has slackened the demand for scrap by some customers, and dealers give varying reports of conditions according to their individual experience. The uneven demand has not been reflected in any change in prices and the rumored agreement for an advance in some quotations has so far had no effect. The following are current Cleveland prices, all in gross tons:

Old steel rails, rolling mill lengths	$17 00 to 18 00
Old steel rails, short lengths	15 75 to 16 50
Iron rails	21 00 to 22 00
No. 1. railroad wrought	16 50 to 18 00
Mill scrap	14 50 to 16 00
No. 1. machine scrap	14 00 to 14 50
Machine shop turnings	12 50 to 13 00
Cast borings	6 50 to 7 00
Grate bars	8 50 to 9 00
Sheet iron	9 00 to 10 00
Stove plate	10 00 to 10 50
Car wheels	15 50 to 16 50

CINCINNATI.

Feb. 4.

The tendency is rather upward than downward in all branches of the iron trade, as has been shown by developments during the past week, and the feeling on the part of sellers that they can afford to refrain from pushing anything on the market. There has been good buying. In the pig iron market it has come from sources that were considered covered for the greater part of the year. In the market for finished material there has been buying from all classes of consumers and they have not shown any change in operations since the advance in bar iron was announced.

PIG IRON.—The buying of pig iron has been of almost all grades, but there has been a noticeably large inquiry for car wheel iron. One sale is reported of 5,000 tons of Northern car wheel iron and good lots of Southern car wheel iron are also known to have been booked. This is especially interesting to pig iron men and consumers of iron, since it means that the car builders are doing a good business, which, in turn, means that the equipment of the various railroads is going to be added to materially. With the experience of the past six months to look back upon the iron trade welcomes any indication that the equipment of all the roads will be added to.

Basic iron has sold in some large quantities one deal having been made for 8,000 tons to go to a Pittsburg interest. Gray forge is in good demand and it was reported, though not verified, that there had been quite a large transaction in gray forge. The element of doubt in the minds of the trade is based on the fact that it is known that there is very little gray forge to be had. If there were gray forge with which to fill orders there would be orders enough and large ones enough to satisfy anybody.

The market has held firm on all Southern grades and Northern irons are quotably higher. In the case of some certain Southern grades some large handlers say that they are not now selling at the minimum price of $12 Birmingham for No. 2 but are getting $12.25 to $12.50. But conditions do not warrant a change of prices on these Southern grades.

It is rather hard work to find foundry irons to fill orders calling for delivery in the first half of the year, and some grades are to be had only after close hunting for later delivery. The melting capacity in Cincinnati proper and the Cincinnati district has been added to and will be increased farther in the spring. The foundries have been able in their new contracts to get the advance out of the castings that they are compelled to pay for iron. Labor, too, is higher than it was a year ago and they are averaging up very well.

In the following quotations Northern foundry No. 1 is advanced 25 cents on the minimum and 50 cents on the outside price. The same is true of No. 2 and Southern car wheel iron is advanced 25 cents on both prices. Quotations f. o. b. Cincinnati are:

Southern Fdy. No. 1	$15 25 to $15 50	Gray Forge	$13 75 to $14 00
" " 2	14 75 to 15 00	Northern Fdy. No. 1	17 35 to 17 85
" " 3	14 25 to 14 50	" " 2	16 85 to 17 35
" " 4	13 75 to 14 00	Southern C.W. iron	19 25 to 19 75
So. Fdy. No. 1 soft	15 25 to 15 50	Malleable coke iron	17 10 to 17 60
So. Fdy. No. 2 soft	14 75 to 15 00		

FINISHED MATERIAL.—The local association of iron dealers met on Thursday of last week and advanced the store prices of bar iron and bar steel both from 1.90c to 2c. This advance followed the recent advance of bar iron on mill shipments to 1.60c Pittsburg. The fact that bar steel did not advance at that time Pittsburg price did not alter the conditions locally as far as prices out of store were concerned. Mill prices at Cincinnati are: bar iron, 1.72c and bar steel, 1.62c. Prices on sheets, plates and angles remain unchanged at prices quoted for weeks.

There is a good demand for all finished material and mills are crowded with orders. Stores have trouble in keeping stocks and deliveries are getting longer instead of shorter. Deliveries on bar iron can be made in 30 days without trouble, but when it comes to sheets and plates, three months comes nearer the time. Deliveries are now asked for by many consumers for the third quarter. January was one of the largest months ever experienced in the business in Cincinnati.

PHILADELPHIA.

Feb. 4.

With stocks at the lowest point yet recorded it will not take very much of a hitch in transportation facilities or elsewhere to give prices a further boost, which may in the end do the business more harm than good. The conservative element in the trade are doing what they can to prevent a wild market, yet the fact remains that those who can furnish material promptly practically hold the market within their grasp. Business in general continues very active and adds greater strength to the market; at the same time it also tends to increase the number of complaints received for lack of promptness in making deliveries.

PIG IRON.—It is the general opinion that the output of the furnaces has been contracted for as far as the end of the third quarter of the year. The outlook for increased supplies is for the present not very encouraging. Prices show an advance of nearly $2 a ton in six weeks, and are still working upwards. While transactions are mostly influenced by conditions more or less personal in their nature the average range of prices for Philadelphia and nearby deliveries would be about as follows: No. 1 X foundry, $18 to $18.50; No. 2 X foundry, $17 to $17.75; No. 2 plain, $16.50 to $16.75; standard gray forge, $16 to $16.25; ordinary gray forge, $15.25 to $15.75; basic (chilled), $16 to $16.50; Bessemer, $19.25 to $19.75.

FINISHED MATERIAL.—In the line of structural material it is simply a question to wait for the time when the mills shall be ready to take orders up in their turn or else the paying of a heavy premium. Instead of bringing relief to this branch of the trade, time actually seems to show a further scarcity. Sheets are in fair demand with prices on desirable orders rather easy. Consumers are showing a disposition to place their orders for plates more freely, evidently fearing that the general buoyancy of the market will raise prices. Quotations are about as follows for city and seaboard deliveries: Plates, ¼-inch and thicker, 1.75c to 1.80c; bars, iron or steel, 1.62½c to 1.70c; angles, 1.75c to 1.85c; beams and channels, 1.75c to 1.85c.

Braddock Machine & Mfg. Co.

(Special Telegram.)

PITTSBURG, Feb. 5.—The plant of the Braddock Machine & Mfg. Co., Braddock, Pa., changed hands last week and the new stockholders elected Alexander R. Peacock, formerly of the Carnegie Co., president; G. C. Sheade, vice-president and general manager, and A. H. Eames, secretary and treasurer. We have official denial of the report that the plant was purchased in the interest of the Carnegie Co.

The referee's sale of the Troy Steel Co.'s plant on Breaker Island, Troy, N. Y., advertised for Thursday, Feb. 6, has been postponed. A new date will be announced later.

PEACE PROPOSALS IN THE ALLIS-CHALMERS STRIKE.

Statements have appeared in the Chicago daily papers from time to time concerning the strike of the Allis-Chalmers Co.'s machinists in that city and the prospects of an amicable settlement. It appears that some preliminaries were gone through with that would facilitate conciliation, some retaliatory prosecutions in the court, of officers of the company being dropped. Then at the solicitation of representatives of the union the Allis-Chalmers Co. made a statement defining its position, and a proposition which embodied the basis on which it would come to an agrement. This was not such a proposal as has been represented in the published statements. In brief, it was of substantially this purport:

Nine hours to be a day's work.

The request for an advance in wages of two cents an hour over wages paid on May 30, 1901, to be granted, and such additional advances to be made as might be justified by individual merit or by rates paid in other leading shops.

The company to give employment to 100 of the strikers within 24 hours after the strike is declared off, and to 80 more within a week, as fast as places could be arranged for them. The company reserved the right to make its own selection of men.

In employing men the company would make no discrimination between union and non-union men.

The company would not discharge any of its present employes except for cause.

This proposition was rejected by the union and it is understood that it announced that no settlement would be agreed to which did not provide—1, for a minimum of 28 cents an hour; 2, for the reinstatement of all the men on strike; 3, for the peremptory discharge of all non-union machinists.

It need not be expected that this program of the union will be carried out. It goes beyond the provisions of the unhonored New York agreement of 1900, to which the officers of the International Association of Machinists were parties, and which conceded the right of employers to judge of the qualifications of machinists and to employ men regardless of affiliation or non-affiliation with the union. As the Chicago conflict stands, there is left no alternative to the employers but to continue the fight unless they choose to make a complete surrender of shop control. It is evident that the union is concentrating its energies upon the Allis-Chalmers struggle, on the presumption that if it succeeds in enforcing its unjust shop regime there few lesser shops will be able to stand before it. It is not by any broad enforcement of unionism in the machine shops of the country that the machinery manufacturers of the United States have been able to attain the position which European visitors freely concede to them. The repeated comment has been made that the machine shop proprietors of the United States are free from the hamperings of trades unions, while British engineering works are controlled by a narrow and stringent policy of limitation. The developments of the past year have opened the eyes of American machine shop proprietors to the conditions as they really exist. It is not the more intelligent and broad-minded administration of the machinists' union that saves our machinery manufacturers, but their own courageous and often very expensive resistance of demands that if granted make them only the servants of the associated machinists, and their chief duties the supplying of their shops with work and the regular provision of funds to meet pay-rolls.

Foundry Iron Furnace for Toledo.

The proposed Toledo, O., blast furnace, of which mention was made in these columns last week, is an enterprise of Pickands, Mather & Co., of Cleveland. The land options secured some time ago expired on Monday and on that day purchases were made of 100 acres of land on the east bank of the Maumee river in the city proper, the site being close to the Wheeling & Lake Erie bridge and a comparatively short distance from Maumee Bay. It is considered in all respects an excellent location for a blast furnace. The straight channel through Maumee Bay to a depth of 21 feet is about to be completed, and there is but a boat-width of water between the government channel and the furnace dock that will be built. Thus ore and limestone will be unloaded from vessels upon the new company's dock and there are such railroad connections as command on about equal terms coke from the Connellsville, New River, Pocahontas and Kanawha fields.

The intention is to begin at once the erection of a modern furnace for the production of foundry and malleable pig iron. Dimensions have not been determined upon as yet, but the height will probably be between 80 and 90 feet and the bosh 18 to 20 feet. A daily capacity of 300 to 350 tons is expected. The design and detail of construction are in the hands of Julian Kennedy as consulting engineer, and the intention is to spare no expense that will yield an adequate return in productive efficiency. It is expected that the furnace will be completed ready for operation by the opening of navigation in 1903.

The natural market for the product of such a furnace is included in a radius of 125 miles from Toledo. While not an important general foundry center, Toledo has easy access to an important consuming district, including Detroit, and its own malleable casting works are considerable consumers.

The enterprise will be carried on by the Toledo Furnace Co., capital, $1,000,000, which has been incorporated at Columbus, O., and is an identified interest of Pickands, Mather & Co. The latter have been for years prominent factors in the ore, pig iron and coal trades and have had Valley furnace connections for years. Iron mines of their own guarantee an ore supply indefinitely.

SCHOOL TRAINING FOR FOUNDRY APPRENTICES.

The regular monthly meeting of the Pittsburg Foundrymen's Association was held at Pittsburg on Monday night, Feb. 3. Paul Kreutzpointner, of Altoona, Pa., presented a paper entitled "What Can Our Schools do for Foundry Apprentices?" which was discussed at length. The meeting was attended by a number of educators, who were very favorably impressed with the efforts of the association to advance technical training among apprentices not only for the foundry, but other industrial institutions. Mr. Kreutzpointner's paper follows in part:

During the last few years the subject of the education, or rather want of education, of the foundry apprentices and workingmen has frequently been discussed in foundrymen's meetings, and the lack of interest in and comprehension for the technical details of their chosen vocation by our young men, whether foundrymen or not, has been declared an everlasting source of annoyance and disappointment to employers and a drawback to employes. In view of these frequent discussions of a serious and all important subject, interesting not only to the foundrymen, but to every thoughtful citizen, I did not consider it out of place to present to you this question of the education of apprentices in a different aspect from what has been usually discussed.

Intelligence, knowledge and skill in the arts and industries fosters culture, civilization and national prosperity, and in return again, culture and civilization promote industrial and commercial activity. Thus far literary subjects have formed the main part, and received most attention, in the curriculum, from the grammar through the high schools, because until recently our high schools were, and to a large extent still are, primarily preparatory schools for our colleges, and therefore the college shaped the curriculum of the high schools to suit their purposes. The grammar schools being natural feeders of the high schools, their curriculum was shaped to suit the needs of the high schools. The needs of the engineer, the mechanic and clerk received very scant, if any, attention, although out of every hundred school boys and girls only five go to college, while 95 enter industrial and commercial pursuits or marry. Thus far these 95 have had to be satisfied with the leavings, so to speak, with the crumbs left upon the table by the five who went to college. Here and there efforts were made to recognize the rights and needs of the 95 not going to college by the introduction of elective studies into the high school curriculum, but with indifferent success apparently because, as long as colleges admit high school graduates without examination on a high school certificate the colleges are necessarily bound, for their own sake, to which is chiefly on literary lines.

This unsatisfactory condition of our schools, unsatisfactory

to those who enter industrial or commercial pursuits, is being recognized by our foremost educators. Thus, in a recent meeting of the New England Association of School Superintendents, it was pointed out by one of the speakers that, since 59 per cent of our children are graduated from grammar high schools and only 5 per cent go to college, the lower grades were most important as influencing much the larger number of pupils and should not, therefore, be arranged solely with reference to the demands of the higher institutions.

To make this dual demand satisfactory to both parties is not so easy, since it is not desirable at all to engraft trade schools upon our public schools, but grammar as well as high schools ought by all means to retain their character as broad, liberal educators and builders of foundations only, upon which the pupil can rear his own structure successfully later on. Educational authorities assure us that the necessary changes can be made, and in a number of cities manual training high schools for the needs of industries, and commercial high schools for our commerce have been established side by side with the literary high schools, with beneficial influence upon the grammar schools. Comparisons will show the radical differences in the curriculum of schools devoted to the education of apprentices and workingmen exclusively, beginning with the pupils at 13 years of age, when they leave the common schools, thus taking in two years of the age of our grammar school scholars, and another curriculum used in the schools of one of our American cities with an exclusively manufacturing population, and is typical of our grammar and high schools. The apprentice schools to which I refer are the so-called progressive schools at Munich, Germany, where I was born, and the course now used has been followed and improved upon since 1870. Please do not understand that I favor introducing European school methods into our own schools. I have no such idea, and understand that our American schools must be developed on lines suitable to our own social and political conditions. But you will agree that the subjects taught must ever form the substance with which to build the foundation for the education of the 95 of our children who do not go to college, and will enter industrial or commercial pursuits. [The speaker here gave the two courses in detail.]

Admitting the desirability of avoiding specialization in our schools and recognizing the great value of a general, or so-called liberal, education, preceding choice of vocation, we have a right to expect nevertheless that this liberal education recognize the future needs of the majority of those whom our schools are to benefit as fully as the needs of the minority are recognized. The future industrial worker or foreman, the railroad man, the future clerk or bookkeeper, the future housekeeper and mother learns nothing, or next to nothing, of the great realm of nature and its laws. They get no proper conception of the wealth of our resources, their location and their nature, which are the foundation, the backbone and mainstay of our material wealth and commercial supremacy. Without our resources, without the exceptional purity of our minerals, the strength of our mines, we could not manufacture and sell as cheaply, transport as cheaply and at the same time live as comfortably as we do.

Where are the choice, though not necessarily large, collections of specimens of our principal resources which ought to be found in every school house and high school, also specimens of the stages of production of the products of local industries, which ought to be the daily help for our teachers and object lessons for our young men, so that they may get an intelligent comprehension of the contents of their country's storehouse out of which they must get a living. A few years ago I was curious to see the natural history museum of a normal school, and I found very little, the most of it consisting of minerals. I then had in my garret as much of the principal mineral resources of our country to show as there was at this important training school for teachers.

President Elliot of Harvard University says our youth should be trained to observe accurately, to record correctly, to compare and infer justly and to express cogently the results of these mental operations. These, he says, are the things in which the population as a mass must be trained in youth if its judgment and reasoning power are to be systematically developed. His training, President Elliot says, ought to be such as to give the young man a proper vision of the great range of knowledge and capacity needed in the business of the world, then he will respect the trained capacities which he sees developed in great diversity in other people.

As long as the state assumes the right to educate the children of the people, leaving them no choice, then it is the duty of the state to provide such educational facilities as will benefit all citizens alike according to their respective necessities, and for the state's own welfare. The state now, through the high schools, makes ample provision to prepare those who are to become apprentices in the art of literature, to serve the community and their own interests, as theologians, as doctors, as lawyers, as soldiers and engineers. What reasons are there why equally ample provisions should not be made by the state for the education of those who become apprentices to be founders, machinists, carpenters, locomotive engineers, clerks, bookkeepers, foremen, superintendents of shops, etc? Is the intelligence and knowledge of the one not as essential to the welfare of the state as the other? Every one of you knows only too well what an irritation, bother and discouragement and loss the average apprentice is, with his indolence and indifference and lack of training, to comprehend his duties and what is wanted of him and best for him. A college would never receive its literary apprentices with so little or no preparation, to take up the details of their chosen vocation.

No matter how many libraries are built, how many trade schools, night schools and special schools there are opened, they will and can serve their purpose, not as fully and advantageously, and therefore will not be as beneficial as expected if those, for whose benefit the money was expended have no previous training for an understanding and appreciation of the nature and value of those things which are offered to them. If the colleges demand a literary preparation of their apprentices, our industries and commerce demand a technical, a scientific, a commercial preparation for theirs. All of us depend upon each other's efficient and successful work for our peace, happiness and welfare. Literary training for those who go to college, manual training for those who are to carry on our industries, commercial training for those who are to engage in commerce, then the foundry industry will prosper and the foundrymen will have a better opportunity to get apprentices, workingmen and foremen who are interested in and have a comprehension of the details and technicalities of their work.

In conclusion let me say that this question of training of apprentices is as much a moral question as it is a material one. The proper performance of our duties to ourselves and our fellow citizens is a high, a noble endeavor. The conscientious daily and hourly performance of our various duties as men and women, as husbands and wives, as citizens and mothers, as employers and employes are synonymous with a high standard of morality, and therefore we are unjust if we blame those for neglect of duty and consequent low moral standard whom the state, that is we, neglected to instruct properly in the performance of their duty. Kindergartens, manual training schools, drawing schools, gymnasiums, playgrounds, if rightly conducted and free from political and social influence give language, form and body, as it were, to religious teaching, just as an object lesson, an experimental lecture, gives a more tangible understanding of the subject taught than book teaching. The German philosopher Fichte once said that "a people whose lowest classes possess the broadest and most general education, will be the mightiest and happiest of the time, invincible to all neighbors, envied by contemporaries and a model for their imitation." Why should the United States not try to attain to this proud position and distinction?

The following were present at the meeting: John McClaren, of Phillips & McClaren; Philip Mathes, Brittain & Mathes; Wm. Yeagle, Wm. Yeagle & Co.; J. E. Malone, J. S. McCormick & Co.; Mr. Sikes; Don Blanchfield, *American Manufacturer;* W. W. Slick, Union Foundry & Machine Co.; A. W. Slocum, Keystone Car Wheel Co.; C. W. Sherman, Pennsylvania Car Wheel Co.; J. S. Early, J. S. Early & Sons; J. A. Scott, Thomas Carlin & Sons; S. H. Stupakoff; R. M. Brown, Damascus Bronze Co.; Armin Schotte; Prof. Reineke, Humboldt School; Prof. Connelly, Allegheny Manual Training School; Messrs. Hill and Hay, of the Whiting Foundry & Equipment Co.; S. D. Sleeth, Westinghouse Air Brake Co.; Keil Hirsch, Mr. Craig, Pittsburg Stove & Range Co.; E. G. Seaman; Ed. Frohman, the S. Obermayer Co.; Mr. Krum, Naylor & Co.; Paul Kreutzpointner, Pennsylvania Railroad Co.'s shops; Robert A. Walker, *Iron Age;* A. O. Backert, *The Iron Trade Review.* After the meeting a lunch was served.

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THE PREMIUM SYSTEM A DIVISION OF PROFITS.

The transplanting of any custom or method from original soil is often attended by well defined changes and the final growth may show characteristics entirely foreign to the original. The English newspapers and several of the trade journals, in their discussion of certain shop methods perfected in this country, have shown a tendency to graft upon the original stock something seldom mentioned in the consideration of the system in the shops of this country. One of our British contemporaries accepts as a matter of course the adoption of a system of fines along with the rewards of the premium plan; apparently expecting special punishments under a management which offered special inducements to greater energy and skill. This view of the matter is a relic of the schooldays where the rod and the reward were ever close companions.

The full benefit of improved methods of production and management is in the fact that there is no rod held out by the employer. It is simply an opportunity for the man who can do more to earn more. If the workman does not care to exert himself beyond the average there is the amount paid for the commonplace performance. Hitherto in shops there was a fear that to rise above this level would mean but a temporary success and that the last state would be worse than the first, the general wage ratio falling with each establishment of a record. So true is it that the whole system is based upon the principle of proportionate reward for ability, that the few instances in which the premium plan has failed of appreciation and of a chance to work its way to full success have been where the employer did not thoroughly recognize the importance of the reward element and carefully estimate his costs and ability to give a strong as well as a permanent inducement.

The thing is simple enough in theory. It is nothing more, for example, than the division by the owner of a boiler, with his fireman, of one-half the value of each ton of coal saved. Yet we grant that there are complex elements even in such a simple instance as the one cited. Given a constant load, the co-operation of the employer in the introduction of labor-saving systems for the handling of ashes, the cleaning of tubes and the indicating of engines, good steam traps on the heating apparatus, a capable engineer at a fair salary, together with equitable adjustment of the percentage of premium for conscientious effort, and the saving may be adjudged without the peradventure of failure. The union of the two interests in such a plan of economical production, the employer and employe profiting alike, has in it the elements of a new status for labor. The shop in which the workman regards the means of production from the same point of view as the owner has possibilities of a more harmonious relationship between the two in addition to a partnership in an increment of profit to which both have contributed. It is profit-sharing on the only plan that can insure permanent and mutual satisfaction.

Columbia Bridge Company Extensions.

(Special Telegram.)

PITTSBURG, Feb. 5.—The Columbia Bridge Co., of this city, with works at Carnegie, has purchased 18 acres of land adjoining their plant. The plant of the Pittsburg Steel Shafting Co., at Rankin, Pa., has also been purchased by the company, and within a few months the machinery in this plant will be removed to the Carnegie site. It is the present intention of the company to erect a merchant mill that will roll rounds up to seven inches in diameter and a structural mill will also be erected for the purpose of rolling small angles and channels. The question of erecting a steel mill is now being discussed by the directors, and it is altogether probable that an open-hearth plant will be built. The company will continue to do strucural work as heretofore and a large portion of the output of the structural mill will be used in this way. Rounds for the shafting department will be rolled on the bar mills and other merchant material will be rolled for the open market. The stock of the company was recently increased from $100,000 to $300,000, and if a steel plant is to be built it will be still further increased. The officers of the company are: Joseph Kountz, president; Thomas W. Fitch, vice-president; Thomas Walker, treasurer, and H. L. Kountz, secretary. The above officers, together with A. Dempster, constitute the board of directors.

Republic Iron & Steel Co. Statement.

(Special Telegram.)

NEW YORK, Feb. 5.—The Republic Iron & Steel Co. issued yesterday its semi-annual report for the six months ending Dec. 31 last. The profit and loss account for that period shows profits from operations, after deducting all expenses excepting repairs and renewals, of $1,419,549.88; charged to renewals, repairs and improvements, $486,426.42; net profits for the six months, $933,123.46. After deducting from net profits two quarterly dividends of 1¾ per cent each on preferred stock, amounting to $711,616.50, there is left a surplus for the six months of $221,506.96. At the close of business, June 30, 1901, there was a surplus of $1,109,655.68, so that the total surplus on the books of the company on Dec. 31 amounted to $1,331,162.64. During the preceding fiscal year, $566,622 was charged to renewals and repairs, whereas for the six months under review $486,426 was charged to that account. The balance sheet shows new construction from July 1, 1901, to Dec. 31, amounting to $1,236,231, making the total expenditure for construction since the organization of the compay $3,618,610. The company's real estate, plants, buildings, machinery and other investments are valued at $41,091,018.

Open-Hearth Plant of Youngstown Iron Sheet & Tube Co.

(Special Telegram.)

YOUNGSTOWN, O., Feb. 5.—The Youngstown Iron Sheet & Tube Co. of this city is having plans prepared by S. V. Huber, of Pittsburg, for a 12-furnace open-hearth plant. Only six of the furnaces will be erected immediately, but it is probable that the additional six will be built within the next few years. The furnaces will have 50 tons' capacity each and the daily output of the six furnaces will amount to about 800 tons.

The report published last week referring to an agreement made between the Amalgamated Association and the American Steel Hoop and the Republic Iron & Steel Companies to operate the mills continuously, pending the summer scale adjustment, is, we are advised, incorrect in so far as it included the American Steel Hoop Co.

CINCINNATI MACHINERY MARKET.

CINCINNATI, Feb. 3.—Things are moving along in a very steady and satisfactory way with machine tool builders of Cincinnati. Trade holds right up and indications at the present time are that the year will be a good one. The volume of the business is all that could be asked and the returns on the output are fully adequate. There were some advances made during the latter part of last year in the prices of special machines and these have generally been maintained. The bulk of the business comes from domestic orders. The foreign demand is small. There is not the regret that this is true that there might be if business were dull at home. When conditions at home change there will be some inquiry into the situation abroad and it may be found that something beside a dull condition over there is responsible for the slight foreign trade; in other words, it may be found that the European machine tool builders have copied American ideas and American patterns to a larger extent than has even been supposed.

Contracts have been awarded for the general construction and the iron and steel work for the new machine shop of the Bullock Electric Manufacturing Co. The contract for the former went to L. P. Hazen & Co., of Cincinnati, and that for the iron and steel work to the Variety Iron Works, of Cleveland. The new machine shop will be 75 feet wide and will eventually be extended to be 1,200 feet long. A smaller building for the accommodation of the employes of the company will be erected between the present administration building and the new machine shop.

The Roach & Van Wycke Machine Tool Co. has started in business in Cumminsville, Cincinnati, and will engage in the manufacture of small lathes. Mr. Roach was formerly a superintendent in the factory of R. K. LeBlond & Co. The company has been buying equipment during the past week.

The American Laundry Machinery Co. has plans drawn for its new building that is to be built just outside the city limits, near Winton Place. President W. N. Carter says that the new factory will be pushed to completion as rapidly as possible because of the great need for the permanent quarters. Orders came in one day's mail this week for work enough to keep the factory busy for 60 days.

The Cincinnati Planer Co. has been adding largely to its equipment since the first of the year. A new universal grinding machine has been put in of Brown & Sharpe make; a new 60-inch planer is being constructed by the company for its own use; a No. 2 horizontal boring and drilling machine is being made by the Fosdick & Holloway Machine Tool Co.; and the Cincinnati Machine Tool Co. is putting in for the concern an upright drill.

The capacity of the John B. Morris Foundry Co.'s plant will be increased in the spring according to present intentions. The capacity is now about 200 tons and the proposed increase will be to 450 or 500 tons. The company already has the property and the plans will soon be drawn for the addition.

The Cincinnati Milling Machine Co. reports a good business for the first month of the year that compares quite favorably with the business of the company for December which was the largest in the history of the company.

The American Tool Works Co. has received a number of orders for tools from the government to go to several of the navy yards.

Plans are being drawn by Bert L. Baldwin & Co., in Cincinnati, for the new addition to the capacity of the International Steam Pump Co. that is to be made in the instance of the new factory at Harrison, N. J. President J. W. Dunn of the company was here looking at these plans last week and it is understood that the new plant will be one of the largest units the company will have.

The Blymyer Iron Works Co. has a number of orders for coffee and sugar machinery for Cuba and Mexico and is pushing that business.

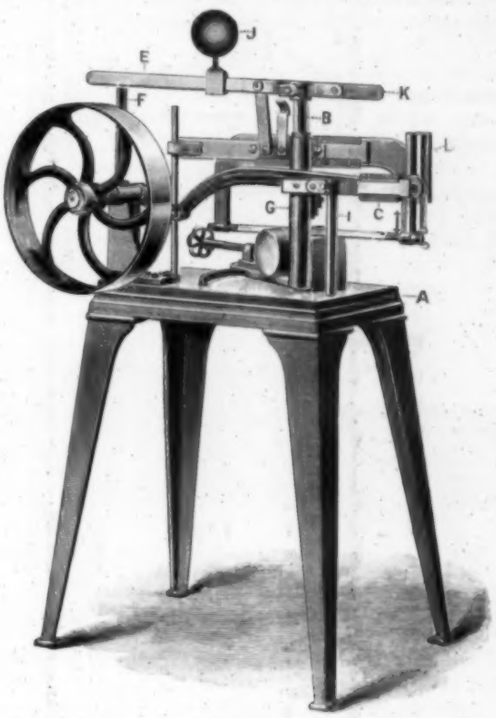
A recent publication of the Industrial Department of the Chicago, Milwaukee & St. Paul railroad is a large folder map showing on one side the tobacco growing districts of Wisconsin and on the other the States of Wisconsin and Minnesota, together with the upper peninsula of Michigan, the five iron ranges being demarked and their principal mining points shown, as is also the copper region of Northern Michigan.

IMPROVED HACK-SAW MACHINE FOR SAWING METALS.

The designer of the machine shown has striven for a compact arrangement providing a firm support for the saw frame and guide, facilities for lowering and raising the saw to and from the work and adjustments for nicely regulating the pressure upon the saw. These advantages insuring rapid operation and a true, vertical cut through the work. A swivel vise holds the work and there is a pointer or indicator to move along a graduated segment so that the vise may be secured at any desired angle.

Referring to the engraving, B is a stout post firmly fixed in the bedpiece A, a sleeve G embraces this post and is adjustable up and down. To this sleeve is firmly secured a horizontal slideway upon which the saw frame slides. The head C moves on a slideway that is supported by the post I and extends into a deep vertical groove D in the saw frame.

The connecting rod connects the head with the crank so that when the machine is in motion the saw frame is reciprocated the same whether in a high or low position. The sawguide H is attached to the sleeve G close to the work and is adjustable in all directions. This is very important to prevent the breaking of saws and to insure a true vertical cut in the work. The studs upon which the saw is hooked in the reciprocating frame hold the sides of the saw in a vertical position at all times without adjusting.



IMPROVED HACK-SAW MACHINE FOR SAWING METALS

It will be observed that the lowering and raising lever E, starting lever F and vise-screw wheel, are all conveniently located at the front of the machine. The weight J is adjustable on the lever E to give any desired pressure on the saw and is held fast by turning the ball.

No countershaft is required, there being a clutch for starting and stopping attached to the machine. It can be placed under a main shaft and belted from a pulley or coupling. These machines are made entirely of steel and iron and the unfinished parts are painted. The machines are built in various sizes, 2x2, 3x3 and 4½x4½ inches, with saws 6, 9, 12 inches in length; the full length of the saw being in use when work is handled to the capacity of each machine.

This line of machinery is manufactured by the sole patentee, L. H. Olmstead, Hasbrouck Heights, N. J.

The West Virginia Central & Pittsburg Railroad Co. has placed an order with the Cambria Steel Co. for 500 hopper bottom steel cars. The cars will be built at the new car plant of the company at Johnstown, Pa.

THE BROWN CORLISS ENGINE WORKS.

Announcement has already been made in these columns concerning the starting of the Brown Corliss Engine Co.'s works at Corliss, Wis. The company was organized in May, 1901, with a capital of $1,000,000, with Walter F. Brown as general manager. It purchased 1,200 acres of land at Western Union Junction, Wis., 23 miles from Milwaukee, and the name of the town was thereupon changed to Corliss. The company has erected in the past year a thoroughly modern plant which when in full operation will employ 500 men. The buildings are of steel and brick construction with a large amount of glass, affording plenty of natural light. The total cost was about $350,000. In the accompanying drawings we present an outline plan and an end elevation, which give a good idea of the extent and arrangement of the various buildings. These are on the east side of Chicago, Milwaukee & St. Paul main line. The machine shop and foundry buildings run north and south. The machine shop is on the west side of the foundry, with a space of 65 feet between them. The pattern shop and pattern storage building, the forge, boiler and engine rooms, and the office, are of brick.

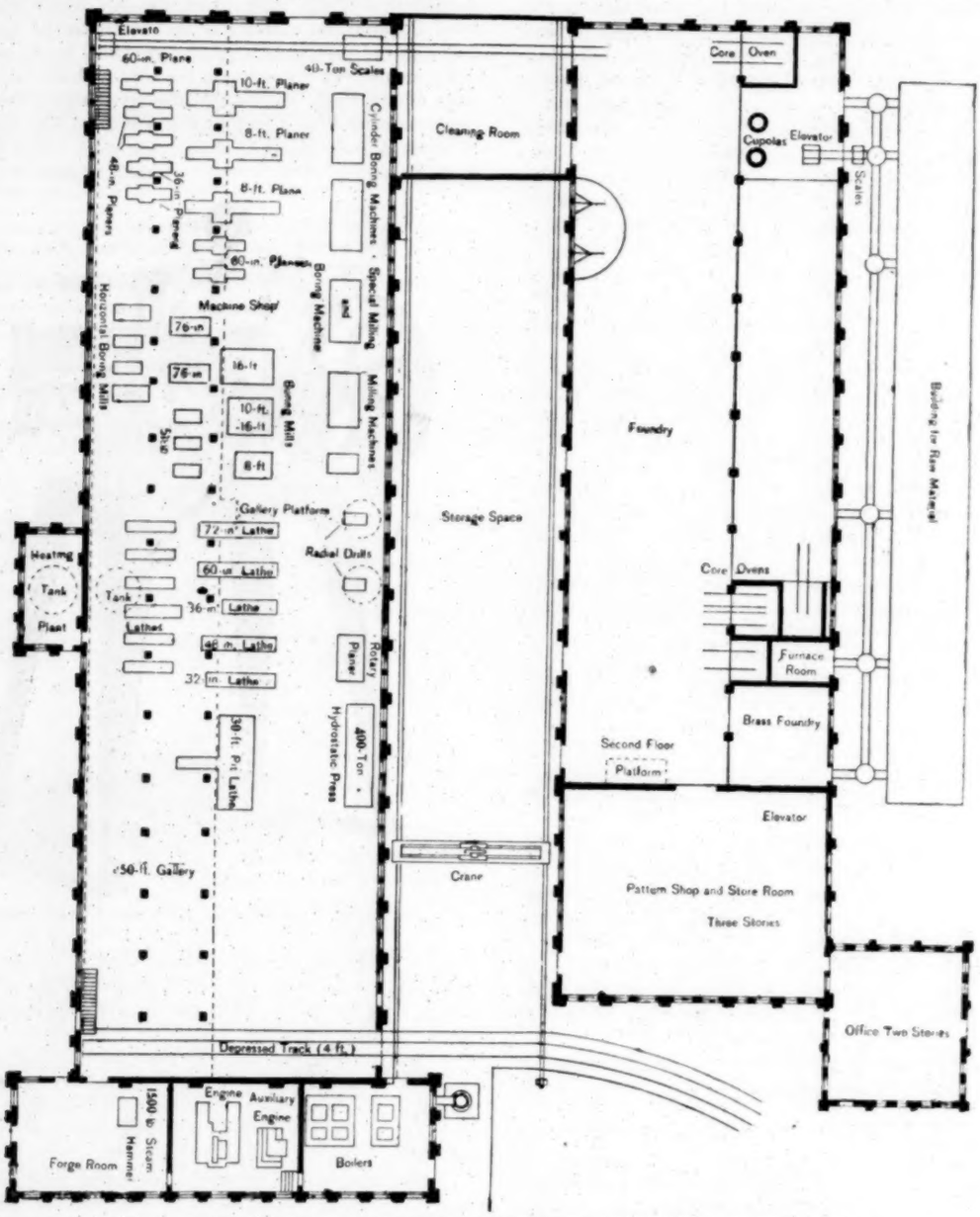


FIG. I.—OUTLINE PLAN OF THE BROWN CORLISS ENGINE CO.'S WORKS AT CORLISS, WIS

Referring to the layout of the plant, the raw materials—pig iron, coke and foundry supplies—are brought in on the tracks on the east side of the foundry, and are delivered at their proper places in the storage building. Narrow gauge tracks running between this building and the foundry provide for the distribution of the foundry materials. The cupolas are located in the north end of the foundry, and when the latter is extended will be in a central location.

There is a 45-foot wing on one side of the foundry which is equipped with 15-ton cranes, having a clear lift of 18 feet under the hook. This will be used for the light and medium class of castings. The main foundry has a span of 70 feet and is equipped with two 30-ton electric cranes with auxiliary hoists of 5 tons capacity. These have a clear lift of 28 feet. The foundry is 110 feet wide and 325 feet long.

The pattern shop and pattern storage building is at the south end of the foundry, being 110 feet in length and 80 feet in width. The lower story will be used for the storage of large and heavy patterns. The second story is a pattern shop, and the third and fourth stories are for storage of medium and small size patterns. A platform is extended out underneath the cranes so that the patterns can be moved from the pattern shop on this platform, and thence handled by the cranes in the foundry. For handling heavy patterns cranes are provided in the storage building.

The space of 65 feet between the foundry and machine shop is served by a 30-ton electric crane, which travels the full length of the two buildings and also passes over the rail-

road track. This space will be used for the storage of flasks and any finished product which it may be necessary to hold for shipment.

Whenever it is necessary to store any finished product it is done by lowering it on a car at the south end of the machine shop, the car then being run out under the yard crane, which will pick up the work and store it in any part of the space between the two buildings. When shipment is required it is only necessary to pick up the parts and load them on cars which stand within the sweep of the crane.

The gallery in the machine shop is made of double width and is placed on one side only instead of being half the width and placed on both sides. This arrangement was decided upon owing to the fact that the wider space could be used more advantageously than could be done with the narrow wings on either side of the buildings. It also has the advantage that better light can be had on all sides of the buildings and better provision can be made for crane service between the two buildings.

The machine shop has a span in the main part of 65 feet, and is equipped with two 30-ton cranes with 40 feet clear lift. Under the gallery floor is a ten-ton crane, which runs the entire length of the shop. The gallery is 53 feet wide in the clear, and is especially suited to the medium and lighter class of work. Particular attention has been given to the matter of lighting, and a very large amount of glass is provided for, ribbed glass being used throughout.

The forge room, engine room and boiler room are located at the south end of the machine shop. Ample room has been provided in the engine room and boiler room to increase the power plant.

The machine shop is 440 feet long and 118 feet wide, provision being made on the north end to extend the shop to any length desired. In the arrangement of tools the group plan has been carried out as far as possible that is, the planers are in one group, the boring mills in another, and so on, in order to have all operations of the same kind done in a particular part of the shop. In equipping the shop with tools only those of recent design and of heavy pattern were selected, so as to secure high cutting speeds and rapid machining, and no tools were purchased which would not in every way fulfill the most rigid specifications.

For transmitting power to the tools it was decided to adopt the multiple voltage system as being the most elastic and best adapted to machine shop purposes. The motors have a variable speed of 6½ to 1, this range being accomplished by using a minimum voltage of 60 and maximum of 250, with intermediate voltages of 80, 110, 140 and 190. It has been the usual arrangement of variable speed motors to make use only of the speeds corresponding to the various voltages, with no provision for subdividing the change in speed from one voltage to another. With this latter arrangement the faults of the stepped cones and belted arrangements were retained.

In the existing arrangement of the motors this trouble has been obviated by using a controller which will divide the range of speed between each voltage into six parts, so that if the greatest change of speed from one voltage to another is 30 per cent, this is divided up into six parts, and practically a continuous range of speeds is provided from the minimum to maximum. No armature resistance is introduced to change the speed of the motor, but the whole change is gotten by the field resistance. Speed curves of the various tools show a very perfect range of speeds. The Bullock Electric Mfg. Co., of Cincinnati, furnishes the entire outfit of motors. It was not thought feasible to carry the electric drive to the extent of driving all of the small tools by individual motors, and these tools have been grouped in 18-h. p. units.

The large tools and erecting floor will be served by two Pawling & Harnischfeger 30-ton electric cranes equipped with 5-ton auxiliary hoists, it being the purpose to use the auxiliary hoists for all work up to their capacity, as the hoisting speeds are very much higher than provided for the 30-ton hoist, the hoisting speed of the auxiliary being 50 feet per minute. The cranes will have a bridge speed of 500 feet per minute, and have been designed especially for rapid service. Wherever it is found necessary to serve large tools with individual cranes, air hoists are used and compressed air will be very largely used throughout the shop and foundry.

The power plant is composed of two direct connected units, one of 125-kilowatt capacity, the other of 250-kilowatt capacity, it being the intention to use the smaller unit as an auxiliary. The 125-kilowatt unit is of the non-condensing compound type, making 250 revolutions per minute. The 250-kilowatt unit will be of the company's own make of the cross compound non-condensing type, and will make 140 revolutions per minute. There are two 175-h. p. water tube boilers supplying steam of 150 pounds pressure. There will be no shafting in the engine room, the transmission of power being entirely electrical.

An elevated track on a trestle is located close to the boiler house and provision is made for delivering the coal directly in front of the boilers. A storage capacity of 500 tons has been provided. Raw material, such as bar iron, for the forge room, will come in on this elevated track.

The buildings are heated by the hot air system, the apparatus being installed under a guarantee to heat the building properly with steam of atmospheric pressure. The exhaust steam from the engines will be used as far as it will go, using live steam to make up any deficiency, this steam being reduced to atmospheric pressure before entering the heating system. The exhaust steam will pass through a 400-h. p. Colles heater before entering the heating system. A special heater has been designed for meeting the requirements of the plant, so as to do away with all turns in exhaust piping wherever possible. The plant was designed and erected under the supervision of Walter S. Whiting, vice-president and treasurer, and W. F. Brown, second vice-president and general manager.

The product of this thoroughly up-to-date plant will be Corliss engines of the heavy duty Tangye frame type, horizontal, compound and vertical up to 7,000-h. p. In time it is the expectation to take up in addition the manufacture of special machinery.

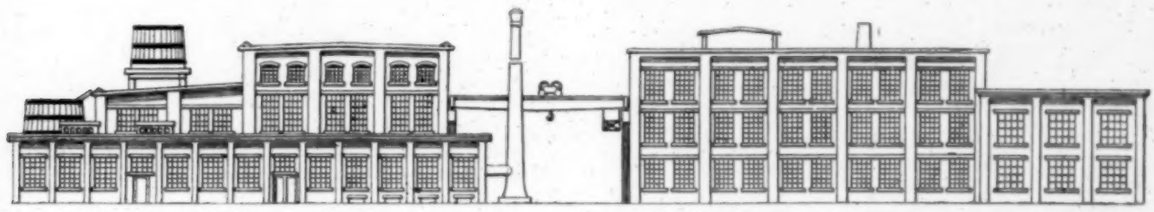


FIG 2 —REAR ELEVATION OF BROWN CORLISS ENGINE CO.'S WORKS

New Records at Joliet Works.

Production records at the Joliet works of the Illinois Steel Co. were exceeded in January, the converting works, billet mill and rod mills making remarkable outputs. On Jan. 30 the No. 2 rod mill, producing all No. 5 rods, turned out 267 tons on the day turn, as against 252 tons on Jan. 1, when its best previous record was broken. On the day and night turns the total for Jan. 30 was 498 tons, as against 474 tons on Jan. 1. The two rod mills together produced 470 tons on the day turn Jan. 30, against 456 tons on Jan. 1, and on the day and night turns, 878 tons, as against 877 tons on Jan. 1. The month's records in the various departments show the following surprising totals in gross tons:

	January, '02.	Best Previous.
Converting works	54,110	52,205
Billet mill	48,667	46,418
No. 1 rod mill, No. 5 rods	10,386	8,988
No. 2 rod mill, No. 5 rods	11,396	10,090
Both mills, No. 5 rods	21,782	18,152

LAKE ORE SHIPMENTS 20,589,237 TONS IN 1901.

Returns direct from the iron mining companies of the Lake Superior region show that the total shipments by water and by all-rail routes in 1901 were 20,589,237 tons. This amount does not include the 230,000 tons shipped from the Helen mine on the Michipicoten range in Canada, the greater part of which was brought to Lake Erie ports for shipment to Ohio and Pennsylvania furnaces.

In the table below the shipments by mines and by ranges are given, and in the supplement accompanying this issue our annual tabular statement of shipments in 1901 and in the 46 years preceding. There are 104 names in the list below, though the number of shipping mines was in reality about 115. The Cleveland Cliffs Iron Co.'s shipments are given under its name, though these came from six properties. The Penn Iron Mining Co.'s shipments are likewise given under the company's name. The Lake Superior group on the Mesabi range represents three mines, the Hull, Burt and Rust. Of the 104 shippers given below, 17 are on the Marquette range, 28 on the Menominee, 24 on the Gogebic, 5 on the Vermillion and 30 on the Mesabi. The Mesabi range is rapidly forging ahead, and there is little question that it will contribute 50 per cent of the 22,500,000 tons generally estimated as the output of 1903. The mines of the United States Steel Corporation contributed 12,459,211 of the total of 20,589,237 tons last year—this in addition to one-half the 507,786 tons from the Pewabic, a half interest in this mine being owned by the Carnegie Steel Co.

MARQUETTE RANGE.

MINE.	GROSS TONS.	MINE.	GROSS TONS.
Beaufort	4,338	Lillie	98,788
Cambria	68,907	Moore	37,655
Champion	99,026	Negaunee	234,713
Chester	22,815	Princeton	67,051
Cleveland Cliffs	874,465	Queen	400,845
East New York	31,696	Republic	104,604
Jackson	38,271	Richmond	54,181
Lake Angeline	481,574	Winthrop	109
Lake Superior	635,642		
Total	3,254,680		

MENOMINEE RANGE.

Antoine	63,429	Hemlock	149,966
Aragon	477,212	Hiawatha	20,355
Armenia	18,780	Hilltop	2,503
Baltic	17,326	Loretto	54,985
Bristol	36,593	Lincoln	19,727
Chapin	929,701	Mansfield	74,113
Columbia	19,963	Millie	12,133
Commonwealth	77,799	Monongahela	2,397
Crystal Falls	230,614	Penn Iron M'g Co	358,126
Cundy	160,519	Pewabic	507,786
Florence	15,395	Quinnesec	66,383
Foxdale	4,647	Riverton	119,860
Great Western	123,261	Tobin	18,957
Groveland	11,444	Verona	11,475
Total	3,605,449		

GOGEBIC RANGE.

Anvil	1,101	Mikado	91,846
Ashland	286,399	Montreal	72,945
Atlantic	190,135	Newport	190,448
Aurora	223,747	Norrie	660,965
Brotherton	103,109	Pabst	198,686
Cary	179,374	Palms	7,603
Colby	23,475	Pike	6,346
Harmony	10,358	Puritan	21,788
Hennepin	21,475	Sunday Lake	89,997
Iron Belt	43,883	Tilden	446,670
Jack Pot	19,988	West Colby	12,836
Meteor	34,140	Windsor	841
Total	2,938,155		

VERMILLION RANGE.

Chandler	627,379	Savoy	212,008
Minnesota	208,284	Zenith	60,082
Pioneer	678,310		
Total	1,786,063		

MESABI RANGE.

Adams	829,118	Clark	199,566
Auburn	427,510	Columbia	15,627
Biwabik	410,074	Commodore	35,546
Chisholm	34,573	Corsica	26,838
Duluth	150,024	Oliver	5,420
Elba	224,630	Penobscot	221,080
Fayal	1,656,973	Pillsbury	120,723
Franklin	39,299	Roberts	42,756
Genoa	332,022	Sauntry	328,739
Hale	30,929	Sellers	34,918
Kanawha	41,300	Sharon	56,810
Lake Superior	594,761	Sparta	156,426
Mahoning	765,872	Spruce	279,515
Malta	126,299	Stevenson	666,273
Mountain Iron	1,058,160	Union	93,109
Total	9,004,890		

Total all ranges..... 20,589,237

In the following table the shipments are given by ranges and by ports and all-rail:

SHIPMENTS BY RANGES.

	1901. Gross Tons.	1900 Gross Tons.	1899. Gross Tons.	1898 Gross Tons.
Marquette Range	3,254,680	3,457,522	3,757,010	3,125,039
Menominee Range	3,605,449	3,261,221	3,301,052	2,522,265
Gogebic Range	2,938,155	2,875,295	2,795,856	2,498,461
Vermillion Range	1,786,063	1,655,520	1,771,502	1,265,142
Mesabi Range	9,001,890	7,809,535	6,620,384	4,613,766
Total	20,589,237	19,059,393	18,151,804	14,024,673

SHIPMENTS BY PORTS AND ALL-RAIL.

	1901. Gross Tons.	1900 Gross Tons.	1899. Gross Tons.	1898. Gross Tons.
Escanaba	4,022,668	3,436,734	3,720,218	2,803,513
Marquette	2,354,284	2,661,861	2,733,596	2,245,965
Ashland	2,886,252	2,633,657	2,703,447	2,391,088
Two Harbors	5,018,197	4,007,294	3,973,733	2,693,245
Gladstone	117,089	418,854	381,457	335,956
Superior	2,321,077	1,522,899	878,942	550,403
Duluth	3,437,955	3,888,986	3,509,965	2,635,262
All-Rail	431,715	489,078	350,446	369,241
Total	20,589,237	19,059,393	18,251,804	14,024,673

It is interesting to note, referring to our iron ore supplement, that the Mesabi range, with last year's total to its credit, has passed the Menominee and Gogebic ranges in total production. Though its first shipment, a single cargo, was in 1892, only 10 years ago, it now has a total of 40,404,967 tons against 37,621,428 for the Menominee range and 34,154,790 for the Gogebic range. The total to date from all ranges is 192,008,221 tons.

PERSONAL.

Samuel McDonald, who recently resigned as superintendent of the Bessemer plant of the Republic Iron & Steel Co., Youngstown, O., was presented with a gold watch, charm and chain by the employes of the plant last week. With Thomas McDonald he leaves for an extended visit in California during the present month.

W. H. Smith, formerly chief engineer of the Union Railway Co., operated by the Carnegie Steel Co., has been elected president of the St. Clair Improvement Co. Mr. Smith's office will be in the Carnegie building until the completion of the Frick building in April.

R. R. Richardson, superintendent of the docks of the Carnegie Steel Co., at Conneaut, O., accompanied by 20 of the heads of departments and assistants, spent several days in Pittsburg last week at the works of the Carnegie Steel Co.

Robert P. Bainbridge, assistant superintendent of the Carrie furnaces of the Carnegie Steel Co., Rankin, Pa., has resigned to take charge of the furnaces of the National Steel Co., at Mingo Junction, O. Before severing connections with the Carrie furnaces Mr. Bainbridge was remembered by the employes at the furnaces with a handsome gold watch, charm and chain.

Patrick M. Galvin has been appointed general yardmaster of the blast furnace department of the Republic Iron & Steel Co., with headquarters at Youngstown, O.

Edwin S. Mills, of Cleveland, assistant general manager of the Pittsburg Steamship Co., and J. R. Mills, Jr., Cleveland manager of sales for the Carnegie and Illinois Steel Co. interests, left Tuesday, Feb. 4, for a trip to California. Mr. E. S. Mills is convalescing from an illness of several months.

Watkin Edwards has been appointed master mechanic of the Bessemer plant of the Republic Iron & Steel Co., at Youngstown, O., to succeed Erskine Maiden, who has accepted a position with the National Steel Co.

On Feb. 1 the offices of N. & G. Taylor Co. were removed to the fourth floor of the Mariner and Merchant building, Chestnut and Third streets, Philadelphia.

BORING AND TURNING MILLS OF THE ROGERS & HEMPHILL MACHINE CO.

The boring and turning mill illustrated in Fig. 1 has been built to supply the demand for a small machine to handle accurately and easily face plate work. The design is compact and simple, the machine is readily operated and the floor space required is but 44x77 inches. The frame is strongly braced and heavy. The cross-rail carries one head with swivel and has a four-hole turret on the tool stake. The swivel is adjustable to any angle and is graduated. Both the vertical and horizontal feeds are provided with an adjustable automatic or hand trip, and all levers are convenient to the operator without change of position. The table gear and pinion are accurately planed and a three-jaw universal chuck built into the table. The countershaft has 18-inch pulleys to be speeded 75 and 90 revolutions per minute, and both belts may be open or crossed, as the case may require. The driving cone has

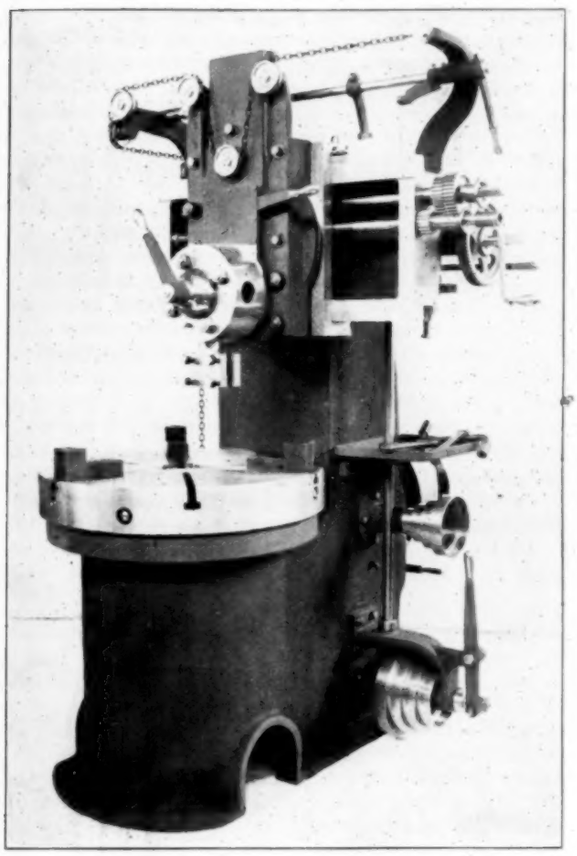


FIG. 1.—31-INCH BORING AND TURNING MILL.

four steps, maximum 18 inches, minimum 10½ inches, and is strongly backgeared, giving 16 speeds to the table. There are eight feed changes. The machine will swing 31 inches, takes 14 inches under the rails and weighs about 5,600 pounds.

The 39-inch boring and turning mill with two heads is shown in Fig. 2. The housings are of the box type, resting on a ledge on top of the base and extend to the floor, being securely fastened to the base by large turned bolts and keys. The saddles, swivels and stakes have exceptionally broad bearing surfaces; the swivels are graduated and may be set at any angle. The cross-rail is fitted with a power lift operated by gears in direct connection with one of the vertical feed shafts and carries two heads. Each of the heads is entirely independent of the other in operation and either may be carried to the center for boring. This machine is fitted with plain table or three-jaw universal chuck and the pinion and table gear are planed and given ample protection from chips and other foreign substances by the overhanging table. The countershaft pulleys are 20 inches diameter to run 160 and 193 revolutions per minute. The five-step driving cone (with steps ranging from 17 to 8½ inches for 3½-inch belt) and back gears are placed between the housings and are capable of giving 20 different speeds to the table. A brake is provided for stopping the table at any desired position. This is operated by a lever placed conveniently near the workman's foot. The feeds are all positive and capable of eight changes; these are obtained by means of pull pins. The machine illustrated in Fig. 2 will take work 30 inches high under the cross-rail and 39 inches diameter, occupies a floor space 75x84 inches and weighs 12,500 pounds.

Other sizes of these tools are built and the mills may be fitted with plain or screw cutting feeds, belt or motor driven. Both machines are built by the Rogers & Hemphill Machine Co., Alfred, N. Y.

The Stowell Mfg. & Foundry Co. of Milwaukee, Wis., has just completed its new malleable plant. The building is 80x200 feet and gives employment for about 100 men. The plant was placed in operation this week.

Work on the erection of the new tube plant of the Wheeling Steel & Iron Co., Wheeling, W. Va., is progressing rapidly and it is probable that work in the socket department will start

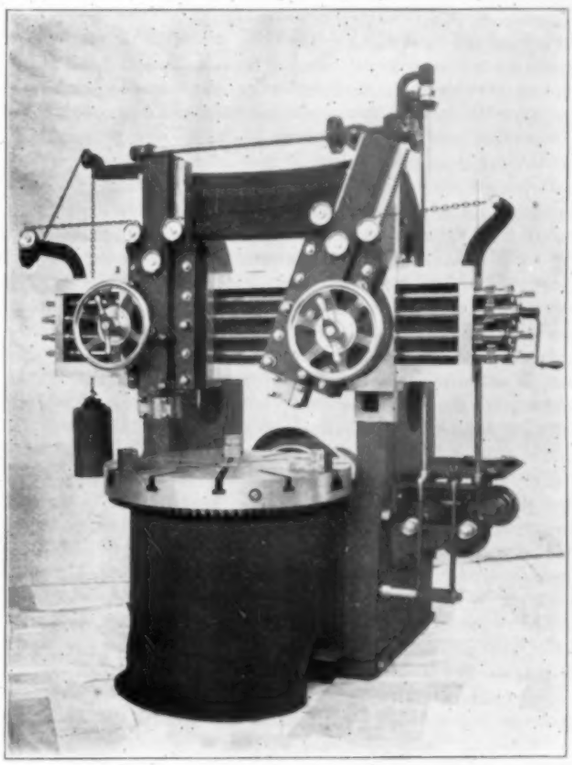


FIG. 2.—39-INCH BORING AND TURNING MILL.

before the end of the month. The skelp mill resumed operations last week, being for a time unable to secure raw material.

The machinery of the Youngstown, O., plant of the American Can Co. is being removed and will be set up in the Chicago plants of the company. It is stated that the Youngstown, O., plant was situated too far from the center of the can market.

The plant of the Buffalo Steel Co., North Tonawanda, N. Y., has been forced to close down temporarily owing to the inability to secure rails for rerolling purposes. At this plant the rails are split and rolled into bars and angles.

The tinning department of the Carnahan Tin Plate Co. of Canton, O., was started last week and three of the six cold mills have been placed in operation. Two additional hot mills will shortly be added.

The plant of the American Tin Plate Co. at Atlanta, Ind., is being dismantled.

The Card Index as a Manufacturing and Selling Tool.

The article published recently in the columns of *The Iron Trade Review* upon the rise of the card index in combination with engineering periodicals is suggestive of the very extensive adoption of this convenient adjunct to the equipment of the engineer and it gives a comprehensive statement of the benefit to be derived from the card index in the library and the drafting room. The use of the card index is not confined to these purposes and it is rapidly making a way in any place where memory needs to be supplemented, sustained or actually substituted by that which cannot forget and is always within reach. On this account we are prepared for the introduction of the card index into the general office and the shop, as an effective means of stimulating the men who are handling large manufacturing industries, either as officer, clerk or salesman, foreman or workman. The increasing use and adaptability of the system in this way is a noteworthy development. Elasticity is an essential requirement in any tool or method for general service and unfortunately special tools lack adaptability for other than the purpose for which they were designed and for which they have especial worth. The card system is a remarkable exception to this general rule, as it is at once capable of all around service in general office or shop use and may be applied with ease to any special field of service.

Manufacturers have today the task of doing something more than the construction of a marketable product. The manufacture of a line of machinery is not complete, unless thorough going plans are laid for the speedy and economical transfer of the machines from the place of manufacture to the shop where they are to be utilized. A vast amount of detail is incidental to this work and the card system is in some form or another adaptable generally. The time when the work of the office hinged upon a single individual whose alert mind was charged with multifarious responsibilities has passed with the extension of these organizations and the memory of the establishment, no less essential and personal a factor than ever, is now constrained to follow plain mechanical lines.

The substance of a correspondence is easily condensed within the limits of a card and by this means the requirements of a prospective purchaser are closely followed; attention paid to him at an appropriate time, and after the contract is made, the goods are delivered in accordance with directions. The last particular is very important, especially if the shipment is to be made abroad where any variation from instructions may result in needless expense or delay to the consignee.

The cards are usually ruled in columns with appropriate headings and may be filled out on this account by what can be termed unskilled labor; yet it is not advisable to economize at the risk of losing some possible value of the system. One establishment of my acquaintance handles considerable jobbing work of a purely transient character with the regular routine of the shop. The workmen's time slips are copied on cards every morning and each task under way has a separate form. The slips are assorted and placed in card cabinet. By this plan there is the time card of the workman indexed under his name and easily found for reference; and the other card with a detailed account of the daily operations with cost of material, etc., is also available for office use in preparing estimates for future work, checking invoices for castings and other material, etc. The time slips and cost cards are prepared in the establishment under consideration by inexpensive labor. The form of the cards was designed for a clear expression of the matter to be tabulated and there seems no possibility for other than a useful and accurate summary of the shop progress in various lines.

Card Index in the Sales Department.

Such a plan serves the small shop very well, but the work of the larger organization demands a more elaborate system. The time and cost accounting plans require necessarily a greater clerical force in proportion to the extent of the business handled. The general plan is the same nevertheless. There are many directions in which the card system may be introduced in the large shop that would be manifestly too unwieldy for a small plant. The former, for example, may have many representatives on the road who send in at definite intervals reports of their progress. The thoughtful manager will not leave the formulation of these reports to the individual adjustment of the writer, but will have a certain uniformity in their preparation, and to that end will have them submitted in predetermined style on sheets, properly ruled in tabular form, so that a permanent record of the present and prospective possibilities of the territory visited may be kept for reference. These sheets vary according to the peculiar characteristics of each business but should have definite statements of the work done, the firms visited, complaints, suggestions regarding defects and merits in either the machinery handled by the salesman or his competitors, names of purchasing agents, suggestions for the office in following up the visit of the representative, probable extension of an old plant or the establishment of a new one, etc. These reports are of great value and the information may be digested on new cards and some can be assigned to the old; as, for example, when the information is given in reference to a firm already on the books.

A Cleveland firm not only carries out the card index very thoroughly with the traveling men but has a map system in connection with it which may be useful in some modification or another elsewhere. The firm has a variety of goods and its extensive line is not of course carried in stock by all the agents and some means is advisable of knowing at a glance just what is handled by the local representative anywhere the line of goods is sold from an agency. It is found that the agents and their various lines are easily divided into a very few classes and these are designated by colors, each of which is representative of a specific line or quantity of goods. A cabinet with shallow drawers is provided with maps fixed upon stout cardboard and the locations of the several agencies are shown by pins. These pins have large heads formed of colored material and, the pins being short and strong, the maps are easily handled, changes can be readily made, and at a glance the promotion department may grasp the situation when placing advertising matter or following up the trail for business.

An Aid to the Drafting Department.

The card index is so manifestly appropriate for the office and the routine bookkeeping that its advantages for the drafting room and the machine shop are sometimes lost sight of entirely. The value of the card index to the engineer as an artificial memory wherewith the material read may be stored up against the day of reckoning has been thoroughly exploited in the article published a week ago in *The Iron Trade Review* and no further reference need be made to this subject. The drafting room is so intimately connected with the engineering department that the above statement may also apply there with the addition that the drawings, blue prints and rough sketches are susceptible of readier handling with the card index than by any other plan known to the writer. The convenient form of these cards suggests the possibility of adopting a uniform size of drawings and blue prints for general use, at least commensurate with more compact proportions than are now commonly in vogue. A drawing 9x12, or even 6x9, would contain sufficient opportunity for very many of the drawings now exploited over much greater areas. The writer has in mind drawings for shop use and he believes the small drawing, even if it spread over onto another sheet with some of the views, would be more useful than the single blanket sheet, newspaper size. Of course the drawing could be made on a large sheet and blue-printed in the same way, being cut up afterwards into the small sheets. Many blackboard sketches and improvements would be more easily kept in reach by being photographed on velox or some similar paper, and indexed directly in the knowledge box in the usual way with the cards. The same plan is applicable to many of the excellent articles which appear in the technical press, the drawings, etc., being thus reduced to uniform dimensions with similar material.

Drawings and blue prints sometimes fail to show a very important detail when it is desired to place the responsibility for a change in the original plan. Each drawing can be rep-

resented by one or more cards and the draftsmen who have done the work, the engineers responsible for the original plan and the subsequent changes, the checker and the time devoted to the task can be noted for preservation. This plan avoids any possibility of error in reaching the right man and does away with the ethical bugbear regarding the placing of several names on a single drawing when the part each has taken in such a composite affair is not readily discerned. The card avoids this ambiguity and affords an opportunity for the expression of data that might be fairly considered out of place on the drawing or blue print.

In the Pattern Shop.

The same scheme works with equal benefit in the pattern shop. A card bearing a rough sketch of the pattern with the number and symbol, or whatever combination may be applied to the designation of the pattern, is excellently adapted for the exhibition of such alterations as may from time to time have been made on that piece of work. The extent of the changes may be shown on the sketch or merely mentioned on the card, but either way the whole story in view with the date, name or initials of patternmaker attached. The number of core boxes, etc., can be entered upon the face of the card and the latter may be cut out of stock having a conventional color to correspond with the brass, steel or cast iron in which the piece is to be made.

A Wider Field in the Machine Shop.

The card index is likely to have a much more important place in the machine shop than it is now accorded. The conditions under which the modern shop is operated tend toward the adoption of this means of simplifying manufacturing processes. The shop is equipped with a supply of machines, these may be numbered, and usually are so provided with numerals, that they can be indexed in office and their upkeep for any repairs or addition to the equipment, new chucks, centers, belting, etc., may be properly charged. The jigs should receive the same care in indexing and, as in the case of patterns, the alterations as well as repairs may have due mention and a clear record kept of the work. Here is indicated a way out of the tangle found in many shops where the old-timer is very much in evidence, and whose memory is not only called upon to announce the fact of a tool being in existence but to suggest its present whereabouts. The development of shops involves the making of tools of little account or of great importance; they are made for a special purpose, and may be known to very few workmen in the shop and to a less number, if any at all, outside that range.

It is obvious that the office and drafting room should have a thorough knowledge of the possibilities of the plant, and that the means of manufacturing should be in the mind continuously. The writer has seen this point recognized in one shop to the extent that a book is kept in each department showing briefly the sizes and location of the special tools in existence throughout the works. Every hob, tap, drill, reamer and the rest of the small tool family are placed on record and the entries are kept up to date by prompt notification of the main office when anything is first put into use. Books are awkward, and the card index presents some excellent features for this work.

Tends to Orderliness.

There is another feature which may be considered in connection with the introduction of a system of this sort. It leads to orderly methods by sympathetic influence. It is in fact nothing more or less than an extension of the tool room, and by providing a place for everything and everything in its place it brings to bear a strong influence upon the working conditions. The foreman notes an improvement that may be at a convenient season introduced into the work, or a workman suggests, or performs voluntarily without the addition of speech, a different and probably a better way of doing things. Memory is treacherous in these matters, and the proper measure is to get it down on paper before it cools. Further consideration may modify, perhaps amplify, the record, and it will be in any case worth the initial effort. Men differ, and this peculiarity may be recorded where one workman is more alert and progressive than another. The written record on a conveniently sized card, protected by a coat of shellac, would go a great deal further than any verbal instructions one could devise at short notice when giving out a job. Accuracy would be gained by its introduction, and there could be no uncertainty about the message which is apt to become involved beyond understanding in transit by speech. The card would in many case be returned with a comment upon the instructions, something which might add to the benefit of the work generally, and at least be valuable as showing the interest and thoughtfulness of the workman, a result not without service to the men in charge.

The card index suggests many possibilities in actual shop service that need not be enlarged upon here. It affords a handy tool, that like the slide rule and the engineer's pocket book, will be best appreciated by the men who use them the most, and they will be adopted with greater ease by keeping them for the simpler purposes at first and extending their sphere cautiously. Under these conditions, and with the intelligent care given by the progressive manager, the card index is capable of a greatly extended usefulness.

R. I. C.

TRADE PUBLICATIONS.

R. D. Wood & Co. of Philadelphia have a new 100-page catalogue of centrifugal pumping machinery. The pamphlet is intended to be more of a general handbook for users of centrifugal pumps than a mere list of sizes of this machinery, and to that end the compilers have included more descriptive matter, useful tables and diagrams than is usually found in the average catalogue. There is probably less of such general information available regarding centrifugal pumps than almost any other form of pumping machinery, and this catalogue will have a much better chance of preservation, and hence be of far greater use to distributor and recipients. A good trade catalogue should pay freight, and to do this effectively it must make a useful impression before reaching the scrap pile. The publication in question has this merit.

The graphite electrodes manufactured by the International Acheson Graphite Co., Niagara Falls, N. Y., are the subject of a publication covering 19 pages. They are an exceedingly interesting production of the keen investigator to whom the industrial world is already indebted for carborundum. Both these substances have been made possible by the great range of temperatures attainable with the electric arc, and are suggestive of the new field for the experimenter in physics, the domain of electro-chemistry. These electrodes may be machined and two parts can be joined by threading and screwing one into a tapped hole in the larger; on one may be given a slight taper and forced into a hole drilled in the latter, which has been reamed out to match. In either case good contact and a tight joint may be obtained and the maximum efficiency be gained with economy.

A card of striking appearance is being mailed to the trade by J. J. McCabe of New York. In the foreground is shown a large pulley and behind it one of the new heavy pattern double spindle lathes. This tool has a 26-inch swing, back-geared, for common everyday jobs, and a 48-inch swing, triple-geared, or with geared face plate (ratio 66 to 1) on which the semi-occasional heavy job is made to pay a proper profit.

The Billings & Spencer Co., Hartford, Conn., manufacturer of machinists' tools, drop forgings and drop forging plants complete, has issued a new drop hammer catalogue. Some of the new features embodied in the present publication are the improved die shoe, a board guard, heating furnace and Lombard's patent lifting jack for raising hammer when changing dies. There is a table of weights of hammers and shipping weights, cubic dimensions for ocean shipments, etc.

The LaCrosse Steel Roofing & Corrugating Co. of LaCrosse, Wis., has dissolved, John C. Kroner and G. F. Kroner continuing the business. Louis Kuehn, the manager of the plant, will go to Milwaukee for the purpose of erecting a similar plant.

At the annual meeting of the Keystone Driller Co. of Beaver Falls, Pa., directors for the ensuing year were elected as follows: Rev. David McAllister, Rev. H. H. George, R. M. Downie, J. G. Downie and J. D. McAnnis.

CLEVELAND MACHINERY MARKET.

CLEVELAND, Feb. 5.—The position of local firms is exceedingly strong and several announce their intention to acquire greater facilities for the adequate handling of business. One of the buildings in contemplation is to be used for the manufacture of hardware specialties, but plans are not sufficiently mature for publication.

The National Iron and Wire Co. has completed plans for a modern structural and bridge shop. The new building will be two stories and will be 75 feet by 50 feet. The framework is to be of steel.

E. Konigslow & Bro., 184-188 Champlain St., Cleveland, have made some additions to their equipment recently, these including a new 750-ampere electro-plating machine and two punching presses, built by the Ferracute Machine Co., Bridgeton, N. J., making in all eight presses. There are now 45 men employed. The firm manufactures light special machinery, punching and forming dies and metal novelties. It is composed of E. Konigslow and R. C. Konigslow.

The Edmonds Elevator Co., manufacturers of passenger and freight elevators, whose plant was damaged by fire on Jan. 23, expects to have the works in operation within the next ten days. At the time of the fire the company had 25 orders for elevators on the books, and when the plant gets under way the machinery is to be run night and day until the lost time is made up. The present plans include the purchase of new equipment—lathes and wood-working machinery.

The Abbott Electric & Mfg. Co., which recently located in Warren, O., reports that it is about ready to start up. All the machinery has been ordered for the new plant and it will be on the ground inside of a week or ten days. Men are at work at the present time on patterns and making tools for a line of plumbers' brass goods. Orders are being received daily, amounting in one mail to $5,000. The plant will probably start up Monday morning at full capacity and will then employ between 40 and 50 hands. A large brass foundry in connection with the plant has been in operation for two weeks and orders for rough castings are regularly received.

The Champion Rivet Co., manufacturer of Victor boiler rivets, has practically closed contracts for the next six months' production. Capacity is being increased by the addition of another new machine at the present works and the construction of a new plant at Parnassus, Pa., is under way. There is every indication that this will be the best year in the history of the company.

The business of the Cleveland Pneumatic Tool Co. is several hundred per cent larger than it was a year ago. The firm is constantly adding to the machine equipment and extending the plant as rapidly as possible. Recent shipments include a complete equipment of pneumatic tools to one of the largest oil companies on the Pacific coast and there are a number of orders on hand for foreign shipment. The firm emphatically denies that it is a part of any combination of manufacturers of pneumatic tools.

The outlook for the year is reported good by the Atlas Car & Mfg. Co. The company has recently closed contracts for industrial railroad equipment for two plants in this city, a large smelter in the West and equipment for tin plate mills. The new style of ingot-mold car is said to be having a ready sale owing to the simpler and stronger construction. The capacity of the plant is being increased by the addition of some new and heavy equipment in the way of bulldozers, punches, etc., to the blacksmith department and further additions will be made during the year.

Jos. Dyson & Sons manufacturers of steel and iron dies, machine forgings, etc., are now making a great many special automobile forgings for the running parts; also crank shafts and plain shafting up to eight inches in diameter. The concern carries in stock a full assortment of forged nuts for two-inch bolts and larger sizes, in both hexagon and square.

There is a great demand for elevating and conveying machinery and C. O. Bartlett & Co., manufacturers of mill and labor-saving machinery, are exceedingly busy and say that the outlook indicates one of the busiest years ever known among manufacturers, especially along the line of coal-handling machines. The firm is now crowded to the limit of present capacity and must necessarily look for larger quarters.

The storm center of activity in the pattern business still continues about locomotive and car building with steam and gas engines of small units a close second, according to the report of the Gobeille Pattern Co. The company is doing a lot of architectural work; the delay in shipment of beams and shapes the past year having led to changed specificattons by architects, especially in the South and West. Business is not expected to lag in the pattern making business as long as locomotives, cars, engines and metal working machines continue to be in demand to the extent of causing some manufacturers to be sold up to middle of 1903.

The Lincoln Electric Co., manufacturers of slow-speed dynamos and motors, is now extremely busy completing orders for automobile motors for a Buffalo firm and for other electrical machinery for a gold mining company in Montana. The shop is also finishing an unusually large order for standard bipolar apparatus.

The Bodifield Belting Co., manufacturers of leather belting, wood split pulleys, etc., says that at this time of the year a dull season is expected, as nearly all new factories, built last summer and fall, have been equipped; contracts are nearly completed and the bulk of the trade restricted to repairs and the replenishing of dealers' stocks. But from January first this season seems to be an exception to the general rule and the plant has been kept busy and running full, filling orders for the kind of trade mentioned above.

Making a conservative estimate, Foote, Burt & Co. are of the opinion that business is as good if not better than at any time during the year of 1901. The work of the shop is confined entirely to universally adjustable, multiple spindle drilling machines and there is plenty of business in hand, with additional orders and inquiries coming in constantly.

The Vulcanus Forging Co. reports the rivet and bolt departments as very busy and says that orders for larger forged nuts have come in so plentifully that the shop is some 60 days behind. The machinery forging department has been kept busy for over a year. Among recently completed orders is the upsetting of the two-inch rods for the Northland and the Northwest.

There has been a very general activity in the tube business as reflected by the orders on the books of the Standard Welding Co. The demand for bicycle parts, rear forks, rear stays, fork sides, seat posts, fork stems, etc., having been exceptionally good during January. All manufacturers of bicycle parts have delayed placing their orders until late in the season, the business being rapidly brought down to a basis of three or four months, actual manufacturing effort, as the bicycle builder is able to obtain all his parts complete. Manufacturers have gradually assumed the position of assemblers of material rather than makers. This enables them to operate the factories at high pressure during the first four months of the year. The automobile and carriage steel rim business is exceedingly good at this date; unexpectedly so for so early in the season. The company has the electric welding plant fully occupied in the working of special material for the trade from points as far west as Denver, Col., and as far east as Boston, Mass. The experimental period is in August or September and the firm is not attempting any specialties at this time in new work as the shop skill and facilities must be confined to the production of goods on order. There is every indication for an excellent business up to at least July 1.

The Electric Controller & Supply Co. will have four times the room now occupied when it is located in the new plant of the Wellman-Seaver Engineering Co. There are a large number of orders on hand and it is expected that full use will be made of the allotted amount of room, and as there is an increasing demand for the Dinkey ventilated controller and the other apparatus manufactured by this company, there are good expectations for doubling the business this year.

The Reliance Gauge Column Co. reports a heavy increase of the business over preceding years. The new trap which has been recently placed upon the market in combination with the other steam specialties is likely to sustain the volume of business now under way.

The G. C. Kuhlman Car Co. is just now moving into the new plant at Collinwood and will probably be running full by the end of the month. The Broadway shop has finished some cars for the Detroit-Toledo Shore Line which are probably the finest turned out by any plant. The company is making good progress with the heavy business, but is necessarily hampered by the moving of plant and the tardy delivery of material.

A report has been current that the Browning Engineering Co. is to build a foundry in connection with the crane plant at Collinwood. The company says however that there is no present intention of doing so.

Lake Superior Iron Ore Shipments (Gross Ton

NAME OF MINE.	Prior to 1885.	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	TOTALS.
Marquette Range.																			
American (Sterl'g)	20,039	.....	.....	1,483	13,699	20,032	21,000	21,604	15,076	.....	.....	.....	.....	.....	.....	.....	.....	.....	112,933
Ames	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,103	5,195	.....	.....	.....	.....	.....	.....	.....	6,298
Barnum (B)	662,249	47,458	52,975	16,123	10,211	12,835	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	801,851
Bay State	16,637	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,637
Bessie	.....	.....	.....	.....	.....	.....	.....	847	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	847
Beaufort	42,868	17,166	17,354	12,829	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,583	4,338	96,138
Blue	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,809	32,171	44,140	.....	2,519	.....	.....	.....	.....	92,639
Boston	61,955	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	587	.....	.....	.....	.....	.....	62,542
Buffalo (A)	.....	.....	10,860	24,686	30,801	50,919	100,464	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	217,730
Braastad { Mitch'l	109,109	.....	7,017	16,419	4,091	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	136,636
Braastad { Wint'p.	402,592	53,913	58,743	74,067	86,789	155,341	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	831,445
Cambria	227,499	50,796	58,784	41,130	57,861	72,780	80,359	34,662	41,549	30,445	47,218	41,656	95,086	110,648	102,623	124,930	80,432	68,907	1,367,365
Champion	1,450,056	173,915	137,593	146,330	174,680	215,098	223,442	133,413	109,979	61,648	42,788	100,398	113,375	141,728	163,190	215,074	113,743	99,026	3,815,476
Chester	225,325	3,437	4,403	1,058	402	.....	.....	.....	.....	.....	.....	.....	.....	3,975	.....	.....	22,585	22,815	284,000
Chicago	9,012	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,012
Cleve'd-Cliffs I. Co.	3,075,092	218,757	203,664	207,441	184,316	274,048	331,713	221,788	310,907	218,105	143,706	221,153	513,119	718,408	869,482	1011,048	881,021	874,465	10,478,233
Columbia (Klom'n)	94,813	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94,813
Curry	.....	.....	.....	.....	.....	16,671	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,671
Detroit	21,525	19,125	39,400	26,099	18,500	10,112	6,080	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	140,841
Dexter	21,080	750	.....	.....	1,821	3,895	9,136	5,448	13,000	7,833	21,740	13,752	18,903	1,154	.....	.....	.....	.....	118,512
Dey	2,709	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,709
East Champion	73,305	.....	.....	.....	.....	2,697	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	76,002
East New York	.....	.....	.....	.....	13,694	29,739	36,431	50,293	35,175	911	.....	.....	.....	.....	.....	.....	27,987	31,096	225,926
Erie	8,136	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,136
Etna	1,091	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,091
Fitch	.....	.....	.....	.....	.....	.....	16,550	15,093	.....	.....	.....	174	.....	.....	.....	.....	.....	.....	31,817
Foster (B)	140,301	9,643	.....	.....	.....	.....	21,949	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	171,893
Gibson	.....	1,515	12,142	2,700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,357
Goodrich	49,754	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49,754
G'd Rapids (Davis)	.....	.....	.....	1,200	11,611	20,058	26,426	9,362	22,823	352	12,073	6,764	67	.....	.....	.....	.....	.....	110,736
Hartford	.....	.....	.....	.....	.....	566	.....	.....	5,678	6,513	.....	.....	1,532	.....	.....	.....	.....	.....	14,289
Hortense (N.Ch'p'n)	.....	.....	.....	886	5,685	7,757	16,246	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,574
Humboldt	594,588	11,766	20,207	19,873	11,655	15,866	23,259	19,879	4,571	.....	.....	.....	2,297	.....	.....	.....	.....	.....	723,961
Iron Cliffs (K)	.....	.....	.....	87,346	78,520	134,616	188,776	278,270	289,395	130,812	253,760	259,042	.....	.....	.....	.....	.....	.....	1,700,537
Imperial	.....	.....	.....	.....	.....	.....	38,460	18,552	7,194	.....	.....	.....	.....	.....	.....	23,235	62,321	.....	149,762
Jackson	2,446,521	68,657	89,370	109,906	101,909	128,891	124,682	92,979	92,567	51,009	32,298	42,186	80,710	79,102	55,012	88,230	31,714	38,271	3,754,014
Lake Superior	3,398,560	226,040	267,622	302,909	240,225	288,784	318,321	308,831	366,715	329,610	344,758	342,439	459,576	376,761	686,563	682,595	709,143	635,642	10,286,094
Lillie	116,844	708	3,957	23,041	32,692	33,916	31,812	19,551	29,005	68,861	78,388	54,285	107,532	112,781	211,023	196,200	114,990	98,788	1,334,374
Lucy (McComber)	307,427	.....	.....	12,139	22,276	32,982	43,483	27,683	26,326	21,964	.....	.....	.....	10,033	11,846	.....	.....	.....	516,159
Manganese	1,881	3,111	1,367	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,359
Marquette (C)	.....	.....	5,229	20,441	7,060	70,128	23,692	16,802	9,555	.....	.....	.....	.....	.....	.....	.....	.....	.....	152,907
Mesabi's Friend	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,503	10,540	.....	.....	.....	.....	.....	16,043
Michigamme (K)	555,427	12,373	48,790	58,726	36,448	56,999	80,777	23,169	1,894	935	1,610	3,214	.....	.....	.....	.....	.....	.....	880,362
Milwaukee	113,405	38,465	46,693	50,490	48,908	52,727	24,763	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	375,451
Moore	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,648	37,655	42,303
National	150,216	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	150,216
Negaunee	.....	.....	.....	5,259	45,304	78,318	76,488	64,218	85,846	69,732	132,581	90,682	175,394	182,169	191,530	195,573	126,829	284,713	1,754,436
" Con. Wks.	11,614	.....	1,094	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12,708
New York (York)	1,035,001	.....	.....	5,128	.....	12,844	2,422	.....	11,220	25,000	21,487	.....	.....	.....	.....	6,642	3,327	.....	1,123,071
N. Y. Hematite	37,587	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37,587
Norwood	.....	.....	.....	2,200	3,553	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,753
Nonpareil (St. Law.)	21,959	.....	.....	1,436	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23,395
Pascoe	31,485	18,249	10,072	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59,806
Pendill	45,993	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45,993
Phœnix (Dalliba)	57,509	.....	.....	1,605	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59,114
Pioneer	.....	.....	5,140	1,203	9,066	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15,409
Pitts. & L. Angel'e	654,204	111,051	131,731	191,120	223,600	229,070	261,681	241,605	287,517	351,973	355,453	313,555	342,251	489,685	460,333	464,988	389,128	481,574	5,990,519
Piatt	.....	.....	.....	.....	.....	.....	.....	.....	2,676	5,448	41,236	13,198	11,296	.....	.....	.....	.....	.....	73,844
Primrose	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,040	.....	.....	.....	.....	.....	6,040
Prince of Wales (A)	.....	.....	.....	.....	.....	.....	32,415	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32,415
Princeton (Sw'ns'y)	143,526	.....	8,328	2,842	.....	.....	.....	7,301	29,403	19,096	.....	6,593	.....	.....	25,247	55,802	75,037	67,051	440,226
Quarts	.....	.....	.....	.....	.....	491	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	491
Queen (A)	.....	.....	.....	.....	5,527	66,122	109,217	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180,866
Queen Group	.....	.....	.....	.....	.....	.....	.....	479,509	379,719	106,864	220,298	160,817	323,057	239,774	61,022	342,978	398,298	400,845	3,113,181
Republic	2,092,830	250,835	241,161	220,624	235,062	287,390	220,065	191,127	167,991	64,195	105,719	174,027	127,380	124,342	140,312	137,085	130,126	104,604	5,014,855
Repub. Reduc. Co	.....	.....	.....	87	21,050	22,122	3,915	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47,174
Richards	.....	.....	.....	1,374	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,887	.....	.....	.....	.....	8,261
Richmond	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,088	4,630	24,464	4,613	51,393	54,181	140,279
Riverside	.....	.....	.....	.....	5,622	3,712	.....	6,783	.....	43	.....	.....	.....	.....	.....	.....	.....	.....	16,160
Saginaw	447,104	.....	.....	.....	.....	.....	.....	4,320	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	451,424
Salisbury (B)	323,743	29,503	51,667	48,304	74,947	72,449	85,798	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	686,411
Sam Mitchell	.....	.....	8,823	8,411	546	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17,780
Samson (Argyle)	257,546	.....	1,133	.....	4,512	2,796	1,218	.....	600	.....	.....	.....	.....	.....	.....	.....	.....	.....	267,805
Section 12	21,887	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21,887
South Buffalo (A)	.....	.....	.....	4,964	24,706	69,359	146,383	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	245,412
Spurr	163,492	.....	752	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	164,244
Star West (Wheat)	39,447	9,200	15,867	17,538	4,987	7,997	15,141	4,412	.....	.....	5,550	51,207	9,658	942	.....	6,716	15,987	.....	204,649
Taylor	32,970	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32,970
Titan	34,317	23,340	13,865	16,003	2,846	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90,371
Volunteer	335,747	5,679	24,034	47,486	56,321	60,156	141,524	92,699	127,130	69,561	26,946	32,672	53,216	1,617	.....	29,983	47,578	.....	1,152,349
Webster	5,377	.....	6,229	2,054	.....	448	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,797	.....	34,905
West Republic	85,576	12,700	10,558	12,872	9,861	1,510	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	133,077
Westmore	9,139	5,887	10,756	3,735	2,074	19,679	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50,870
Wheeling	4,098	6,383	.....	74	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,555
Winthrop	.....	.....	.....	.....	.....	.....	109,576	122,042	191,658	180 071	134,365	119,120	150,496	106,894	122,592	171,318	148,945	109	1,557,180
Miscellaneous	.....	.....	.....	[oo]393	[oo]289	¶893	.....	.....	.....	†1,687	.....	‡1,261	‡1,041	⁂986	.....	.....	.....	.....	6,550
Total	20,292,167	1430,422	1627,380	1851,634	1923,727	2642,813	2993,664	2512,242	2666,856	1835,893	2059,330	2097,838	2604,221	2715,035	3125,039	3757,010	3,457,522	3254,680	62,847,473
Mesabi Range.																			
Adams	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59,141	234,562	170,738	390,860	720,474	777,346	829,118	3,182,239
Aetna (Lowmore)	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,645	.....	.....	17,723	.....	.....	.....	.....	.....	19,368
Auburn	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	108,210	376,970	131,478	175,263	235,630	385,992	263,602	427,510	2,104,745
Biwabik	.....	.....	.....	.....	.....	.....	.....	.....	.....	151,500	90,048	247,069	242,565	427,464	383,180	553,836	924,868	410,074	3,430,604
Canton	.....	.....	.....	.....	.....	.....	.....	.....	.....	24,416	213,853	359,020	16,261	.....	.....	99,498	.....	.....	713,048
Chisholm	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34,573	34,573
Cincinnati	.....	.....	.....	.....	.....	.....	.....	.....	.....	26,372	.....	17,187	57,324	32,912	.....	246	.....	.....	134,041
Clark	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63,071	199,566	262,637
Cloquet (Vega)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,628	47,700	96,280	12,215	.....	1,621	.....	.....	163,444
Columbia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15,627	15,627
Commodore	.....	.....	.....	.....	.....	.....	.....	.....	.....	65,137	7,213	.....	22,063	60,798	80,494	152,947	278,416	35,546	702,614
Corsica	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26,838	26,838
Day	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18,651	1,975	.....	.....	20,626
Duluth	.....	.....	.....	.....	.....	.....	.....	.....	.....	37,626	.....	.....	.....	.....	112,155	165,435	128,587	150,024	593,827
Elba	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	564	9,547	121,707	224,630	356,448
Fayal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	136,601	248,645	642,939	575,933	1072,257	1,252,504	1656,973	5,585,852
Franklin	.....	.....	.....	.....	.....	.....	.....	.....	.....	46,617	223,399	286,423	231,086	30,128	200,400	60,000	168,524	39,299	1,285,876
Genoa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17,136	309,514	279,677	276,559	253,651	332,022	1,468,559
Hale	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,616	24,167	31,004	70,006	13,728	.....	18,807	32,901	30,929	225,158
Kanawha	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,963	64,218	41,300	120,481
Lake Sup. Group	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58,123	67,659	259,912	135,404	154,326	284,023	594,761	1,554,208
Manoning	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	117,884	167,245	519,892	520,751	750,341	911,021	765,872	3,753,006
Malta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28,615	65,346	126,299	220,260
Minnewas	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,858	2,140	.....	.....	.....	.....	.....	.....	.....	15,998
Mtn. Iron (& Rath)	.....	.....	.....	.....	.....	.....	.....	.....	4,245	119,818	573,440	371,274	142,021	773,538	630,955	1137,970	1,001,324	1058,160	5,832,745
Norman	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34,999	93,392	77,523	101,077	110,141	.....	.....	.....	421,132
Ohio	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28,943	69,925	47,350	101,807	293,651	172,597	.....	714,073
Oliver (I)	.....	.....	.....	.....	.....	.....	.....	.....	.....	123,015	505,955	500,377	808,291	601,072	349,100	.....	244,876	5,420	3,138,106
Penobscot	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,933	29,652	85,619	146,641	221,080	494,925
Pillsbury	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	99,691	106,487	101,032	120,723	427,933
Roberts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18,614	.....	57,847	41,965	42,786	161,182
Saintry	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53,004	68,560	328,739	450,203
Sellers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47,433	153,037	.....	112,765	174,867	56,280	34,918	579,300
Sharon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56,810	56,810
Sparta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66,722	226,156	237,143	202,144	156,426	888,591
Spruce	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	101,675	279,515	381,190
Stevenson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56,031	666,273	722,304
Union	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,297	93,109	101,406
Williams (N. Cin'ti)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,046	11,249	.....	.....	12,357	18,238	.....	44,890
Total	.....	.....	.....	.....	.....	.....	.....	.....	4,245	613,620	1793,052	2781,587	2882,079	4275,809	4613,766	6626,384	7,809,535	9604,890	40,404,967
Miscellaneous	1,879	441	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,320

A—Now Queen Group. B—Now Iron Cliffs. K—Under Clev'd-Cliffs I. Co. after '95. I—Mesabi Mtn. and Lone Jack. C—1898 and later in Winthrop. D—Ch
* Iron Mountain. [oo] North Republic. ¶ Edison. † Northwest. ‡ Schadt. ⁂ Palmer. ⁂ Ogden.

NAME OF MINE.	Prior to 1885	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	TOTALS.
Menominee Range.																			
Ashine									4,377	5,618		27,931	110,821	98,847	104,510	93,025	119,940	63,429	618,503
Appleton									167,948	127,901	138,209	2,107							12,102
Aragon						1,745	46,609	96,829				183,296	95,809	149,594	295,821	337,807	404,645	477,212	2,523,425
Armenia						50,275	26,649					2,015						18,750	97,749
Baldic																		17,326	17,326
Bass			1,585	1,226				1,409											4,211
Breen	17,430																		17,430
Brier Hill	14,981																		14,981
Bristol (G)									57,352	9,612						80,915	51,639	36,593	236,101
Calumet	38,713																		38,713
Chapin	973,385	157,455	198,871	336,128	290,871	518,900	742,843	488,749	660,052	489,134	235,895	618,589	420,318	643,402	724,768	940,513	929,937	929,701	10,299,601
Columbia	27,056		14,282	2,377	10,936	11,385	60,133	70,770	57,682	22,426	10,300	70,967	87,202	24,623	14,199	126,290	97,531	19,963	728,022
Commonwealth	279,030	42,947	51,189	56,609	61,818	108,515	116,786	134,982	249,113	151,291	174,921	208,890	93,707	98,283	250,687	117,296	53,342	77,799	2,327,194
Cornell	42,672		4,566	2,064															49,302
Crystal Falls	1,341						3,974					13,037	44,526	95,210	128,233	147,346	197,770	230,614	862,051
Cuff																20,210	38,209		58,419
Cundy	79,317	4,897			5,376	24,722	72,162	100,681	125,773				8,395	41,942	76,877	100,902	141,148	160,519	524,783
Carry (F)	144,259	49,897	57,189	14,297	14,693	6,101	7,361	10,599	1,697										416,928
Cyclops (F)	3,918	9,880	17,648	2,272									52						256,093
Delphic																			33,770
Dober (H)				24,677	118,096	151,828	156,963	162,721	133,666	58,590	24,558	90,885	47,081	31,062	5,009	10,980	49,203		65,192
Dunn	66,655														49,381	7,458			1,056,946
Emmett	8,509																		66,655
Fairbank	315,031		8,210	79,309	142,585	196,269	218,570	48,806	48,246	9,634	2,726	22,830	35,136	37,594	93,663	74,256	85,756	15,395	8,509
Florence																		4,647	1,384,075
Foxdale	44,122		22,267	23,239	21,860	38,454	72,546	62,464	87,487	661			14,643		33,851	43,316	98,550	123,261	4,647
Great Western								1,049										11,444	686,721
Groveland						5,961	1,496	67											12,493
Half and Half																			7,524
Hamilton			872	600	8,801	8,347	17,072	58,197	2,183										98,072
Hemlock								35,531	65,459	11,325		940	94,645	96,032	69,865	110,269	72,413	149,966	708,452
Hensel							955												955
Hiawatha										1,683		1,201					11,008	20,355	34,247
Hilltop																3,496	6,410	2,503	12,409
Hollister																			4,098
Hope							2,020	1,057	1,021										17,818
Indiana	9,278	2,739	5,854						15,543	2,275									17,871
Iron River (H)	182,068	55,693	78,591	83,018	110,000	179,238	155,458	59,345	1,176										904,587
Kesl Ridge	59,465								5,997	3,298		19,441				4,900			93,101
Lamont (Monitor)						12,348	31,139	26,226	42,819	13,777	2,600					67,652	31,323		227,884
Lee Peck (D)									2,844										2,844
Lincoln								1,813	26,019	8,757						43,622	72,959	19,727	172,897
Loretto										8,131	55,983	53,160	34,334	54,104	68,447	64,824	61,219	54,985	455,187
Ludington	268,139	124,194	74,454	101,653	61,883	116,297	97,355	141,303	15,777	109	354								1,001,518
Manganese							6,844												6,844
Mansfield							18,303	49,836	69,259	69,558				37,182	60,739	86,607	90,155	74,113	555,752
Mastodon	40,241	11,737	41,640	48,792	51,463	63,511	66,526	45,370	9,150	23,485		23,733	60						425,708
Metropolitan	88,074		6,393	9,070	3,490														107,027
Michigan Explo. Co.										505	77	1,071		216					1,869
Millie (Hewitt)	29,295	4,627	5,517	1,163	11,124	12,274	39,232	5,889	6,780		13,062	10,924	21,815	10,374	17,430	15,194	14,922	12,133	231,755
Monongahela																		2,397	2,397
Nanaimo	69,321		5,400	30,460	5,744		3,441	13,200											127,566
Northwestern	17,206																		17,206
Norway (F)	768,130	67,741	93,878	95,726	87,260	68,044	61,717	4,089	44,767										1,291,352
Paint River	24,140	2,373	13,933	10,240	12,506	32,700	62,654	45,435	18,390								1,316		221,687
Penn Iron M'ng Co.										280,450	175,274	280,622	179,917	237,886	223,713	229,651	197,606	358,126	2,173,245
Perkins	311,349	18,020	12,852	10,834	16,684	12,354	11,971					2,161							397,225
Perry	3,138																		3,138
Pewabic							26,991	64,507	115,273	165,745	304,010	262,551	273,587	279,855	305,072	540,129	374,043	507,786	3,209,549
Quinnesec	246,937	14,110	13,442	6,585	2,249							761				11,050	25,967	66,383	387,484
Riverton																2,262	71,004	119,860	193,126
Selden			790	1,302															2,092
Sheridan						1,102	595	7,137	45,745	2,234		16,758	3,419	146		31,104	8,063		116,289
South Mastodon					2,722	4,005	1,476												8,203
Stephenson	34,745		1,018	3,589															39,350
Stuntson River				6,829	7,800	4,775													18,404
Tobin																		18,957	18,957
Verona																	5,143	11,475	16,618
Vulcan (F)	548,245	124,125	143,930	205,036	129,541	153,900	104,996	78,997	179,904										1,668,654
Walpole				1,740	900	9,614	2,940	5,895											19,089
Youngstown	29,834		25,635	34,418	12,699		44,460	3,705				13		661					151,425
Total	4,986,023	690,435	880,006	1193,343	1191,101	1796,754	2282,237	1824,619	2261,499	1466,197	1137,949	1,923,798	1,560,467	1,937,013	2,522,285	3,301,052	3,261,221	3,605,449	37,621,428
Vermilion Range.																			
Chandler					454,612	306,220	336,002	373,989	651,655	435,930	558,050	605,024	471,545	438,365	715,919	808,359	644,801	627,379	7,027,830
Minnesota	62,124	225,484	304,396	394,252	57,341	635,318	552,000	517,570	498,353	370,303	390,463	432,760	448,707	592,196	426,040	457,732	325,020	208,264	7,176,343
Pioneer						3,144	12,012	3,079	2,651			40,054	149,073	297,108	123,183	339,897	450,794	678,310	2,099,306
Savoy (and Sibley)																86,191	175,116	212,008	473,315
Zenith									14,991	14,388			18,765	40,817		79,323	60,989	60,082	288,455
Total	62,124	225,484	304,396	394,252	511,953	944,682	880,014	894,618	1167,650	820,621	948,513	1,077,838	1,088,090	1,278,481	1,265,142	1,771,502	1,655,820	1,786,063	16,977,243
Gogebic Range.																			
Ada																7,977	25,047		33,024
Anvil				10,075	24,676	47,000	45,690	73	42,090		13,297	68,064	57,483		5,037			1,101	314,586
Ashland		6,741	74,015	175,563	174,183	257,915	435,949	267,439	231,896	66,067	83,020	126,096	91,149	111,625	123,208	154,615	252,961	286 399	2,898,841
Atlantic				1,369								70,989	60,727	50,307	38,058	19,964	135,955	190,135	567,504
Aurora		5,422	94,553	159,252	179,937	199,865	246,696	83,554	319,482	179,028	203,152	245,883	187,169	166,122	133,076	170,369	193,111	223,747	2,990,417
Bessemer			4,788	16,101															20,889
Blue Jacket				1,799															1,799
Brotherton			8,880	21,721	40,639	53,267	80,486	46,574	130,833	18,905	47,148	40,567	50,490	46,186	73,198	78,858	89,804	103,109	930,665
Cary (and Superior)						56,542	116,203	121,186	106,484	28,578	16,559	52,349	38,821	37,308	43,162	62,524	125,496	179,374	984,586
Chicago													504			633			1,137
Colby (E)	1,022	84,302	257,432	258,518	285,880	136,833	193,038	9,619	69,968	59,346	32,616		48,492	22,921	152,875	163,239	32,572	23,475	1,772,148
Eureka							23,794	13,907	10,655	31,385	18,329	26,105	4,544						128,719
Federal							21,150	6,778											27,928
First National				1,997															1,997
Harm'ny (G'rm'nia)		5,468	19,734	61,714	53,918	103,169	52,000	22,383	4,283	7,964				1,015			986	10,358	342,992
Hennepin					28,721	76,545	63,903	15,759									7,728	21,475	214,131
Imperial									8,515										8,515
Iron Belt				30,000	51,551	110,368	1,506	161,635	23,976	45,109	148,228	81,351	96,763	58,418	105,934	54,064	43,883		1,013,386
Iron Chief			9,960	2,249															12,199
Iron Chief No. 2			551																551
Ironton			18,424	24,762		8,635	6,247	300											58,368
Jack Pot									3,944	1,651				1,265			33,893	19,988	61,741
Kakagon			18,497	52,179	1,228														71,904
Meteor (Comet)							2,882	10,144	54,779	9,604	11,782					332	7,844	34,140	131,507
Mikado												4,788		11,397		10,324	1,090	91,846	119,445
Minnewawa																1,255			1,255
Montreal			23,013	43,989	38,015	42,724	16,728	70,108	58,723	34,299	46,037	138,882	131,531	191,106	270,776	153,307	107,524	72,945	1,439,712
New Davis							1,497		21,754	15,210		10 253				5,029	3,569		57,312
Newport			20,184	75,660	69,145	36,987	71,488	105,606	165,962	109,718	150,392	157,821	142,369	150,979	196,953	263,711	217,201	190,448	2,124,624
Nimikon			4,105	23,217	1,313														28,635
Norrie		15,419	124,844	237,254	412,196	674,394	906,728	758,572	985,216	472 062	621,608	738,490	329,068	604,281	700,990	714,689	666,389	660,965	9,623,135
Odanah			13,714	30,475	5,412	13,354	1,965		6,711	3,956	2,437								77,124
Pabst		1,103	17,979	19,906	49,976	116,376	172,060	130,236	113,245	104,510	206,074	219,960	68,984	220,496	223,891	263,809	239,242	198,686	2,366,583
Palms				1,414	9,725	35,245	50,604	32,227	102,382	2,658	37,911	46,966	114,108	207,153	175,925	154,706	139,658	7,603	1,118,283
Pence					26,687	574							13,185	120					40,566
Pike																		3,434	6,346	9,780
Puritan (Ruby)			16,388	45,000	3,058	9,472	11,694	913										21,798	108,313
Section 33						73,370	126,963	38,576	14,681										253,590
Shores																			55,808
Sparta									2,912			1,950	12,196	16,102	15,691	11,819			4,862
Sunday Lake		1,405	10,963	18,137			6,010	64,902	56,046	22,876	34,323	20,970	80,441	45,815		12,526	74,097	89,997	547,508
Superior			2,690	27,763			36,675	10,710	13,192		30,597								121,627
Tilden								28,415	233,356	135,118	209,077	418,188	250,205	276,890	287,203	500,830	481,909	446,670	3,267,861
Trimble			10,780	12,764	2,387														25,931
Tyler's Forks							10,683												10,683
Valley			1,878																1,878
West Colby																		12,856	12,856
Windsor						14,576	37,210	97	53,242	2,474		11,438	28,154	385			488	841	148,905
Total	1,022	119,860	753,362	1322,878	1437,096	2008,394	2847,810	1839,574	2971,991	1329,385	1809,468	2,547,976	1,799,971	2,258,236	2,498,461	2,706,856	2,878,296	2,938,155	34,154,790
GRAND TOTAL	25,143,215	2466,642	3565,144	4762,107	5063,877	7292,643	9003,725	7071,053	9072,241	6065,716	7748,312	10,429,037	9,934,828	12,464,574	14,024,673	18,251,804	19,059,393	20 589,237	192008,221

D—Cherry Valley Ore. E—Includes Tilden up to 1891. F—1893 and later under Penn Iron Mining Co. G—Formerly Claire. H—Now Riverton.

Report of United States Steel Corporation to Stockholders.

Preliminary to its first annual meeting the United States Steel Corporation has sent to its stockholders the following report which reviews the operations of 10 months and gives details of the organization and policy of the corporation which are the first authentic statement of these matters:

To the Stockholders of the United States Steel Corporation:

The business of the United States Steel Corporation for all practical purposes began April 1, 1901, from which date interest on the bonds and dividends on its preferred stock began to accrue. The board of directors has determined that the fiscal year, instead of running from April to April, shall correspond with the calendar year, and, in order to give sufficient time for preparation of annual reports to stockholders, the by-laws have been amended so as to provide that future annual meetings shall be held in April. Under the provisions of the original by-laws, the first annual meeting must be held Feb. 17, 1902, and the board of directors deems it best to submit to the stockholders at that meeting a preliminary report which, as far as practicable, shall exhibit the operations of the Corporation for the nine months of the calendar year ending Dec. 31, 1901.

Eight directors whose terms are about to expire being those of the first of the three classes, viz.: Marshall Field, Daniel G. Reid, John D. Rockefeller, Jr., Alfred Clifford, William E. Dodge, Nathaniel Thayer, Abram S. Hewitt and Clement A. Griscom, will be candidates for re-election at the annual meeting on Feb. 17, 1902.

This preliminary report covers only the first nine months of the corporation's existence, a period too brief to satisfactorily organize and systematize the business, and necessarily it lacks the fullness and definiteness of information which it is hoped will characterize future annual reports. But the management feels fully justified in stating that much that at the time of organization was hoped to be accomplished in the way of avoiding wasteful expenditures for unnecessary enlargement of plants by various prominent steel companies, and of establishing harmonious co-operation among them has been successfully achieved. The several companies have effected many economies which have been attended with most satisfactory results, and the outlook for further improvement in this direction is most gratifying. The business of the companies has been put on practically a cash basis. The losses actually incurred through bad debts have been very small, and little, if any, loss in the collection of accounts and notes receivable is anticipated. About 70 per cent of the total current monthly accounts due from customers is now being generally collected within thirty days, and it is the effort of the several managements to maintain the businesses on a strictly cash basis.

The results of operations for the nine months are as follows:

NET EARNINGS

Of all companies from operations for nine months ending December 31, 1901, viz:

April	$7,356,744	
May	9,612,319	
June	9,394,747	
July	9,580,151	
August	9,810,880	
September	9,272,812	
October	12,205,774	
November*	9,795,841	
December (estimated)	7,750,000	
Total		$84,779,298
Less amounts set aside for the following purposes, viz.:		
Sinking Funds on U. S. Steel Corporation bonds and bonds of subsidiary companies	2,263,292	
Reserve Funds	9,695,702	
		11,958,994
Balance		$72,820,304
Nine months' interest on bonds		11,400,000
Balance		$61,42 ,304
Nine months' dividend on stocks:		
United States Steel Corporation:		
Preferred, 5¼% (7% annually)	$26,752,894	
Common, 3% (4% annually)	15,227,812	
Total	$4 ,980,706	
Outstanding stocks of subsidiary companies	25,101	
		42,005,807
Balance for nine months, applicable to additions to surplus new construction, etc.		$19,414,497

*During the close of lake navigation, from December to April inclusive, the earnings of mining and transportation companies are, of course, diminished.

From the foregoing statement, it will be seen that the net results from operations of the several companies for the first nine months (December being estimated) are as follows: After charging to operating expenses, month by month, all current renewals and ordinary repairs for maintenance of plants, the net earnings of the several companies amounted to almost $85,000,000. From this sum over $2,250,000 was set aside in a sinking fund to retire bonds of the corporation and its subsidiary companies; $11,400,000 was paid for nine months' interest on the corporation's bonds; dividends on the preferred stock at the rate of 7 per cent per annum were paid, amounting to $26,750,000, and dividends on the common stock at the rate of 4 per cent per annum were paid, amounting to $15,227,000, making a total of over $53,000,000 paid out for interest and dividends on the bonds and stock of your corporation during this period.

Nearly $10,000,000 was set aside in various reserve funds to cover exhaustion of the ore properties, general depreciation of machinery and plants, and to provide for extraordinary enlargements, after all of which there remained as the result of the above nine months' operations undivided earnings of over $19,000,000. A satisfactory profit and loss statement showing in detail the earnings and expenses of the several companies cannot be given until their accounting systems are uniform, so that one consolidated profit and loss statement of all companies can be made. The foregoing statement, however, gives a substantially accurate account of the results of the business for the first nine months, except that the earnings for the month of December are estimated.

Balance Sheet.

The date of this report renders it impracticable to give a complete balance sheet as of Dec. 31, 1901, and consequently a balance sheet showing the condition of the companies at Nov. 30, 1901, is submitted. It exhibits the assets and liabilities represented by the capital stocks of the corporation and by outstanding stocks of subsidiary companies except that, for simplicity, it omits indebtedness from one company to another, as such sums though assets of one company are liabilities of some other company.

ASSETS

Property Account:			
Cost of properties owned and operated by the several companies			$1,437,494,869 53
Deferred Charges to Profit and Loss:			
Expenditures for improvements, explorations, stripping and development at mines, and for advanced mining royalties, which are to be charged to future operations of the properties			3,256,774 09
Investments:			
Outside Real Estate and Other Property			429,613 25
Current Assets:			
Inventories	$95,603,997 57		
Stocks, bonds and securities of outside companies	7,251,329 45		
Accounts receivable	$45,269,453 19		
Bills receivable	2,821,463 55		
	$48,090,916 74		
Cash	55,315,527 99		
	103,406,444 73		
			206,261,771 75
Total			$1,647,443,021 62

LIABILITIES.

Capital Stock of U. S. Steel Corporation:			
Common	$508,212,543 70		
Preferred	510,173,778 40		
			$1,018,386,322 10
Capital Stocks of Subsidiary Companies not held by U. S. S. Corp. (par value):			
Common stocks	365,436 38		
Preferred stocks	293,300 00		
Lake Superior Consolidated Mines Sub. companies	113,189 43		
			771,925 81
Bonded and Debenture Debt:			
United States Steel Corporation bonds	303,450,000 00		
Funded debt of sub. companies held by the public	59,349,838 85		
Debenture scrip	41,844 57		
			362,841,683 42
Mortgages and Purchase-Money Obligations (Subsidiary Companies):			
Mortgages	3,457 937 55		
Purchase-money obligations	15,6.0,754 03		
			19,067,791 58
Current Liabilities:			
Pay rolls and accounts payable	22,228,343 60		
Bills and loans payable (subsidiary companies)	12,653 744 27		
Special deposits due employes and others	5,435,342 15		
Accrued interest and unpresented coupons	4,870,410 16		

Common dividend No. 2, payable Dec. 20, 1901	5,081,790 00	
		50,269,630 18
Contingent Liability:		
Payment contingent upon retention of leases		525,398 67
Sinking funds and reserves for depreciation		21,236,040 54
Surplus of U. S. Steel Corporation and Subsidiary Companies		174,344,229 32
		$1,647,443,021 62

Inventories.

The inventories represent raw material, goods manufactured and in process of manufacture, and manufactured goods in transit, on consignment or at selling departments. A large part of the inventories on Nov. 30 is made up of the necessary accumulation during the summer and fall of extensive tonnages of iron ore for conversion during the winter and spring, when, owing to the close of navigation mining and shipping are diminished. The amount of finished product on hand is largely due to inability to obtain freight cars for deliveries to customers. The inventories are taken on the basis of the actual cost of the materials including labor at the several departments of the companies holding the same, and this cost is below the average current market price of such commodities. The following is a general classification of the inventories on Nov. 30:

Ores	$34,776,053
Pig iron, scrap, spiegel and ferro	4,752,750
Coal, coke and other fuel	1,160,361
Pig tin, lead, copper, spelter, nickel, etc.	2,087,531
Manufacturing supplies and miscellaneous stores otherwise unclassified	12,170,161
Ingots, blooms, billets, sheet and tin bars, skelp, rods, muck bar, etc.	9,343,894
Finished products	15,321,636
Mining supplies and stores	1,170,859
Railroad supplies and stores	851,645
Materials, labor and expense locked up in current uncompleted bridge contracts	9,268, 61
Materials in transit and on consignment	4,699,746
Total	$95,603,997

The item of $21,236,040.54 for sinking funds and reserves for depreciation in the balance sheet is made up as follows:

Sinking fund on U. S Steel Corp. bonds	$1,520,000 co
Sinking funds on bonds of Sub. Cos.	1,264,197 50
Reserved for general depreciation, including that of the ore, coal and coke properties, and for extraordinary outlays which may be required for unusual expenses, for improvements and for renewals	18,451,843 04
Total	$21,236,040 54

Organization and the Issue of Stocks and Bonds.

Supplementing the information communicated by the amended certificate of incorporation and the amended by-laws, copies of which are annexed, the following general statement as to the organization of the corporation is submitted:

The United States Steel Corporation was incorporated under the laws of the State of New Jersey, the original certificate of incorporation having been filed at Trenton, Feb. 25, 1901, and the amended certificate, April 1, 1901. By the amended certificate, the authorized capital stock of the corporation was fixed at 11,000,000 shares of the par value of $100 each, equally divided into 5,500,000 shares of seven per cent cumulative preferred stock (preferred as to both dividends and capital), and 5,500,000 shares of common stock.

Of the total authorized capital stock, there have been issued, and at this date (Jan. 10, 1902) are outstanding 5,102,056 shares of preferred stock, and 5,082,273 shares of common stock. The corporation also has issued $303,450,000 of five per cent bonds secured by a Trust Indenture, dated April 1, 1901, to the United States Trust Company of New York as trustee.

Substantially all of these bonds and shares have been issued to acquire the bonds and stocks of the subsidiary companies which were held by the public, as well as considerable amounts thereof, which belonged to members of the syndicate and to the syndicate managers, viz.: (1) the bonds and stock of the Carnegie Company and the capital stocks of the several other companies under the original agreement of March 1, 1901, with J. P. Morgan & Co., managers of a syndicate which includes among its members and participants officers and directors of this corporation; (2) the stocks of the American Bridge Co. and the Lake Superior Consolidated Iron Mines under the agreement of April 1, 1901, with J. P. Morgan & Co.; (3) the stocks of the Oliver Iron Mining Co. and of the Pittsburg Steamship Co.; and (4) the stocks of the Shelby Steel Tube Co., for which a contract was negotiated in June, 1901, with representatives of the stockholders of that company.

Details of Issue of Stocks and Bonds.

(1) 4,247,688 shares of the common stock and 4,249,716 shares of the preferred stock and $303,450,000 face value of bonds of the corporation were issued in payment for the $25,000,000 in cash, paid to the corporation by the syndicate managers, and for the stocks and bonds set forth in the following table, excepting 1,644 shares otherwise acquired, and directors' qualifying shares, viz.:

Federal Steel Company	Common Stock	$46,483,700
	Preferred Stock	53,260,200
National Steel Company	Common	31,970,000
	Preferred	26,996,000
National Tube Company	Common	40,000 000
	Preferred	40,000,000
American Steel and Wire Company of New Jersey	Common	49,981,400
	Preferred	39,999,000
American Tin Plate Company	Common	28,000,000
	Preferred	18,325,000
American Steel Hoop Company	Common	19,000,000
	Preferred	14,000,000
American Sheet Steel Company	Common	24,499,600
	Preferred	24,499,600
Carnegie Company	Common Stock	160,000,000
	Bonds	159,450,000

(2) 722,025 shares of common stock, and 741,915 shares of preferred stock of the corporation were issued for the acquisition of $29,413,905 par value of stock of the Lake Superior Consolidated Iron Mines and $30,946,400 of common stock and $31,348,000 of preferred stock par values of the American Bridge Co.;

(3) 92,500 shares each of common and preferred stock of the corporation were issued for the acquisition of an outstanding one-sixth interest in the Oliver Iron Mining Co. and in the Pittsburg Steamship Co., thus securing the ownership of all of the stock of those two companies not owned by the Carnegie Co. except directors' qualifying shares; and

(4) 20,045 shares of common stock and 17,910 shares of preferred stock of the corporation were issued for the acquisition of $8,018,200 of common stock and $4,776,100 shares of preferred stock, par values, of the Shelby Steel Tube Co. under the contract above mentioned.

The Aragon iron mines leasehold and the stock of the Bessemer Steamship Co. have been purchased for cash paid and payable by this corporation or by some of the subsidiary companies above mentioned.

All of the bonds of the Carnegie company and all of the stocks of the companies acquired as above mentioned by the United States Steel Corporation, have been lodged with the United States Trust Co., as trustee, for the benefit of the corporation and its stockholders, and to secure the payment of the $304,000,000 bonds of the corporation authorized by the deed of trust of April 1, 1901. This deposit affords security to stockholders as well as bondholders against diversion or depletion of these important assets of the corporation.

Circulars, dated March 2, and April 2, and 8, 1901, addressed to the holders of shares of the several companies therein specified were issued and published by the syndicate managers. At the rates offered in the circular dated March 2, 1901, the syndicate acquired the common stocks and preferred stocks of the seven companies (other than the Carnegie company) as above mentioned (see p. 15), and thereupon sold and transferred the same to this corporation under the contract of March 1, 1901. The syndicate delivered to the holders of such stocks of said seven companies in the aggregate 2,694,909 shares of common stock and 2,616,957 shares of preferred stock of this corporation. The syndicate acquired 60 per cent ($96,000,000) of the stock of the Carnegie company, and $159,450,000 face value of the five per cent bonds of the Carnegie company by delivering to the holders thereof said $303,450,000 of bonds of this corporation and $1,200,000 in cash; and the syndicate acquired the remaining 40 per cent ($64,000,000)of the stock of the Carnegie company by delivering to the holders thereof 982,771 shares of preferred stock and 902,790 shares of the common stock of this corporation.

The residue of the common and preferred stock of this

corporation delivered to the syndidate under the contract of March 1, 1901, and not used for the acquisition by it of the stocks of the specified companies, being the shares which, as stated in the syndicate circular of March 2, 1901, were to be retained by and to belong to the syndidate, amounted to 649,987 shares of preferred stock, and 649,988 shares of common stock. This residue of stock or the proceeds thereof, after reimbursing the syndicate the $25,000,000 in cash which it paid to the corporation, and approximately $3,000,000 for other syndicate obligations and expenses, constituted surplus or profit of the syndicate.

The transactions between this corporation and the syndicate having been concluded, an agreement of final settlement and mutual release, dated Jan. 3, 1902, was executed between this corporation and the syndicate managers.

It will be noted that this corporation has received and now owns in the aggregate more than 99¾ per cent of the shares of all the specified companies. The acquisition of so large a proportion of the shares has enabled the corporation promptly to enter upon the accomplishment of the principal objects which induced its formation, and has facilitated the fulfillment of the original expectations of large reductions in expenditures for improvements, of increased earnings applicable to dividends, and of greater stability of investment, without increasing the prices of manufactured products.

Lease of Pocahontas Coal Fields.

Subsidiary companies of the corporation have secured a lease of 50,000 acres of the best Pocahontas coking and fuel coal property, on a royalty basis, and on favorable terms for production and transportation. Plans for the prompt development of this property on a large scale are under consideration, and it is expected that in the near future there will be received from this field a large supply of coke and fuel coal. With this acquisition, it is estimated that there is now controlled by subsidiary companies a sufficient quantity of the best and cheapest coking coal to provide, on the basis of present consumption, for the necessities of all the furnaces of these companies during the next 60 years. The corporation has guaranteed the performance of this lease on the part of the lessees.

General Results in Organization and Manufacturing.

It was expected that by harmonious co-operation of the several companies great economies in manufacturing would be accomplished, and such expectations have been fully realized. Diversified management has been dispensed with as far as possible, and the several companies have endeavored to adopt similar methods as far as suited to their respective businesses. Great departments like ore mining, coal mining, manufacture of coke and lake transportation, have been thoroughly systematized, and the managements of the manufacturing plants in the same locality have been brought into closer relations.

The companies have endeavored to concentrate the manufacture of their various products at the point most favorable to their production, thus insuring to each ultimate economy in manufacturing costs and in assembling of material. The effort also is made by the different companies to regulate their manufacture of various products so that the fullest advantage can be taken of the economical production of any special article and its cheapest distribution to the consumer.

While each of the above schemes of organization has effected great economies, yet in no direction has this result been more pronounced than in that of manufacturing itself. By frequent interchange of views and full information as to the results in the several companies, each is enabled to reap the advantage of any new economy practiced or discovered by any of the others, so that each company has the advantage of the combined experience of all. Methods of accounting are being made uniform as rapidly as possible so that comparisons may readily be made. In this way, the best result attained by any of the companies is taken as the standard and the other companies endeavor to conform thereto.

Economies in manufacturing thus far have been quite remarkable, but the end is not nearly reached, nor is it likely soon to be, for through the continuous efforts to co-operate and aid in bringing about the best results at each plant, it is certain that even more favorable results ultimately will be accomplished.

The Business Outlook.

The outlook for the year 1902 is very bright. Everything indicates that all of the facilities of each subsidiary company will be taxed to their utmost to supply the demand that is being made. The actual business now booked, and of which shipment is being called for faster than it can be supplied, amounts to more than half the total combined annual capacity of all the companies. The heavier products, like rails, billets, plates and structural material are sold up to the productive capacity of the mills, until nearly the end of the year. In the more highly finished products, the consumption in each case is greater now than at the corresponding period of 1901, which, it should be remembered, was an abnormally heavy year. The expectation, therefore, of those closely connected with the manufacture and sale of these highly finished products, is for a demand even larger than that of 1901, and up to the limit of production.

Policy as to Prices.

The demand for the products of the several companies has been so great that prices could easily have been advanced. Indeed, higher prices have been voluntarily offered by consumers who were anxious for immediate execution of orders, but the companies have firmly maintained the position of not advancing prices, believing that the existing prices were sufficient to yield a fair return on capital and maintain the properties in satisfactory physical condition, and that the many collateral advantages to be gained in the long run by refusing to advance prices would be of substantial and lasting value, not only to the companies, but also to the general business interests of the country.

The strong position thus taken by the companies for stability in prices both of raw material and finished products, has had a reassuring effect on the trade, and has contributed greatly toward restoring confidence in the general business situation and creating the present large demand for the steel products, by dispelling any doubt as to prices in the future.

The board takes pleasure in acknowledging the loyal and efficient services of the officers and employes of the corporation. By order of the board of directors,

ELBERT H. GARY, Chairman Executive Committee. CHARLES M. SCHWAB, President.

THE NEW EAGLE PIPE WRENCH.

Since Stillson developed and patented his pipe wrench many years ago there has been no radical improvement or change in this style of tool. This was a great invention and so perfect in its design that it has been adopted throughout the world. Many attempts have been made by various manufacturers and inventors to improve on this wrench, but nearly all

have been for the most part copies of the Stillson construction. The illustration exhibits a recent addition to the list of pipe wrenches, which is a departure from the construction of the regular tool. It has derived its name from the peculiar shape of its jaws. It will adjust itself instantly to any size of pipe or rod within its capacity, and the harder the operator pulls on the handle the more firmly the jaws will grip the pipe. A backward motion will instantly release the hold, so that in this respect it can be operated very much the same as a ratchet wrench. The manufacturer had in view the production of a pipe wrench that should be quick and convenient to operate, and have a firm grip without slipping. This wrench is especially adapted for the use of machinists, steam and gas fitters, also to be part of a tool kit for automobiles. It is made from drop forgings, well finished and tempered, and will take any size pipe, bolt or nut from ⅛ inch to ¾ inch diameter. These wrenches are 6 inches long and weigh 8 oz. The manufacturers are the Frank Mossberg Co., Attleboro, Mass.

AMERICAN METHODS IN STRUCTURAL WORKS.

A plentiful volume of literature is being produced in England just now, having for its text the American works visited by English engineers in the past year. We have reprinted much of this comment, particularly as it serves to emphasize the difference between American and English practice, and in part because the views of competitors in the international trade race are often instructive, even though at times not thoroughly appreciative. The following is a synopsis taken from English exchanges, of a paper read at London, Jan. 14, before the Institution of Civil Engineers by H. B. Molesworth. His subject was "American Workshop Methods in Steel Construction."

The author, in noticing the fact that many recent contracts for steel work had been secured by American manufacturers in competition with English firms, suggested that a description of American methods would be advantageous. The quantity of American first-class work was excellent, in design, material, workmanship, and finish, and was fully equal to English work. The cost of labor, though higher as regarded the amount earned by individual workmen, was lower than in England when the quantity of work turned out was taken into account. English bridge works were frequently cramped for room, and hampered with old-fashioned and obsolete machinery, while American works were kept up to modern requirements and obsolete machinery was turned out as soon as it was superseded by anything more efficient. Works in America usually ran night and day, and American workmen took fewer holidays than English workmen.

The author confined his description to the bridge department of the Pencoyd works of the American Bridge Co., near Philadelphia, and after giving a general description of the works, traced the material from the bridge shop yard through the various processes into the loading-up yard whence it was shipped. The bridge shop was electrically driven, the cranes and larger machines having each its independent motor. The material was moved longitudinally through the shop on trolleys and transversely by electric cranes, the shop was roofed in, and the floor was boarded; the material rested almost entirely on skids, and every process moved it farther along the shop till the finished work merged at the opposite end to that at which the steel entered. The output in gross tons per man, per annum, averaged: draughtsmen, 771; bridge shop, 115; forge, 45; eyebars, 185; templaters, 2,366.

The steel was open-hearth steel, rather softer than was generally used in England, of excellent quality, and giving very uniform tests. The greatest care was taken to deliver all material into the bridge shop yard perfectly straightened. The drawings were prepared in a very complete manner and gave much more information than was usually furnished on drawings in England. Great care was taken to minimize smith's work, and to duplicate as many parts as possible. Stops, guides, automatic spacing punches, and multiple punches were largely used. The angle-shear was used much more than in England, and joists of the largest size were sheared at one cut without any distortion; punches and dies were all made on automatic lathes and were interchangeable. All the larger shearing machines were mounted on turntables. Plates were handled under punches by roller frames or goose-necks, and moved by a chisel bar working on a fulcrum. Rimmering was done by gantry drills, which resembled a Wellington crane with eight radial drills on it. Pneumatic drills and riveters and chipping machines of the Boyer type were much used, and bad holes, which were very uncommon, were trimmed and not drifted. Ends of long pieces or drilled by compressed air drills fed up to the work by a compressed air cylinder behind them. Large plate girders were riveted by hydraulic gap riveters mounted on a ram to raise or lower them, the work being suspended from an electric Wellington crane traversed by a switch on the riveter platform. Ends of members were milled by rotary planers which had heads 4 ft. 6 in. to 6 ft. in diameter, with cutter fixed near the periphery. Angle-stiffeners were beveled in pairs in a milling machine with fast vertical feed and fitted perfectly. Large joists or channels were handled with clip-hooks furnished with chisel points. Very little planing was done in the works; "Universal" plates were used, and were rolled by nearly all American plate-mills without extra charge.

The causes of cheap working in America might be summed up as follows:

1. The workmen, though more highly paid than in England, turn out a much larger quantity of work.
2. The arrangement of the works is more carefully thought out, and labor-saving appliances are more used.
3. There is more method, and probably more scientific knowledge, in the drawing office.
4. The works are run night and day.
5. The templating is reduced to a minimum by care in the drawing office and by the use of automatic machinery and stops and guides.
6. Obsolete machinery is turned out of the works as soon as superseded by anything better.
7. All tools are kept in a state of perfect efficiency.
8. Railway freights are lower than in England.

The responsibility for the small output per man in England rests only partially with the manufacturer, who is hampered in every effort to introduce improvements by the action of the workmen. The author suggested improvement on the following lines: (*a*) A careful arrangement of works to avoid unnecessary handling and give ample facilities for such as was necessary. (*b*) More complete drawings. (*c*) The condemnation and removal of the obsolete machinery and the proper maintenance of what was in use. (*d*) Ample motive power. (*e*) The more extended use of stops, guides, and multiple and spacing punches.

The saving which was possible by systematic methods in the drawing office, and the use of stops and guides and multiple punches, so as to reduce the templating, is very great. Small portions of the work should be made interchangeable and turned out without having to mark each piece. The use of the spacing punch obviates the necessity for wooden templates, and for marking.

Referring to the business outlook for 1902, J. Frank Dye, president of the Newport Sand Bank Co., Newport, Ky., says that the company's business is more than double that of any previous year up to this point. He adds that while this may be due in no small measure to the merits of the company's products, to its location and increased facilities, and to its advertising methods, it is more particularly a strong indication of a general business prosperity that seems unprecedented.

We learn from *Engineering*, London, that "Messrs. Neilson, Reid & Co., of the Hyde Park Locomotive Works, Springburn, have, with the view of encouraging their workmen to keep good time, intimated to all their employes that everyone who loses not more than eighteen hours' time till the end of June will receive a bonus of a week's wages. The experiment is creating great interest among the workmen, and is already bearing fruit in the men turning out more promptly in the mornings. It is understood that the men will receive the week's pay before stopping for the Glasgow Fair Holidays."

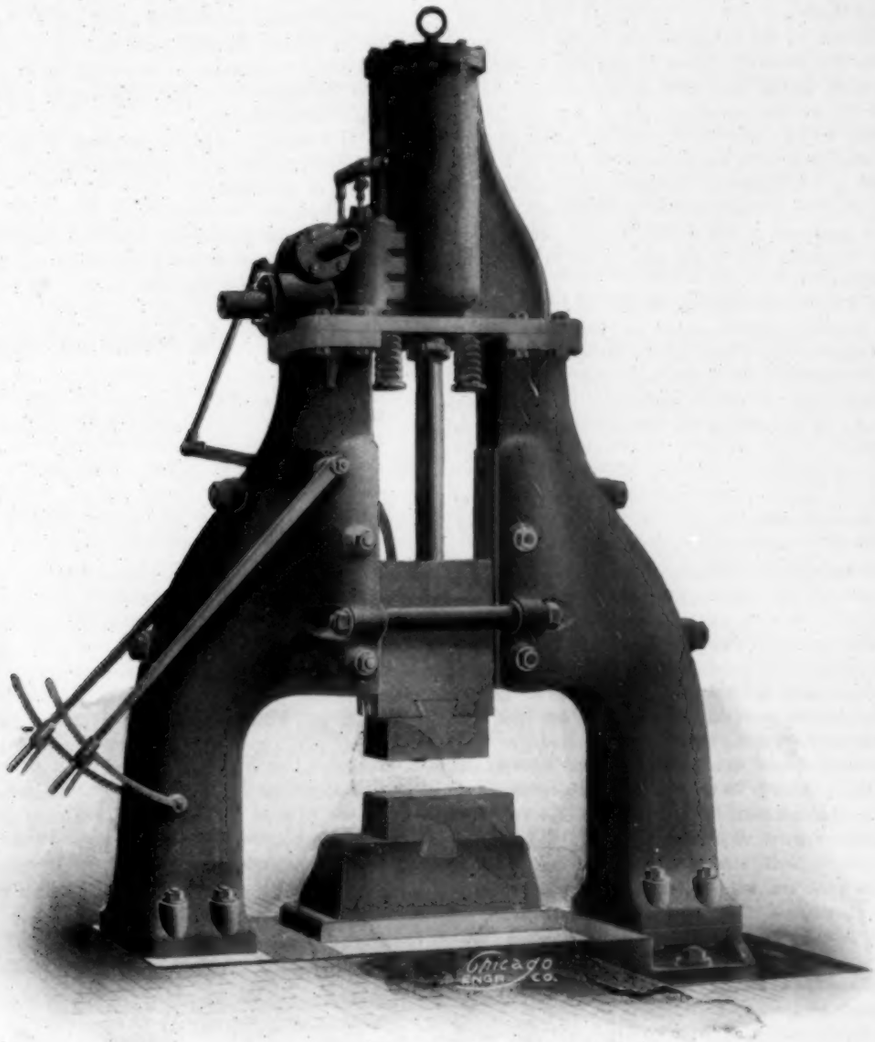
Some managers have a different method of handling the tardy individuals and perhaps the bonus allotted to the workman who does not exceed the eighteen hour limit is balanced by the "bounce" given to the one who passes the dead line.

In the February issue of the *World's Work* M. G. Cunniff writes on "Increasing Railroad Consolidation." A tabulation of mileage controlled by syndicates is given and a map showing the five great groups of roads. The article shows how the absorption movement has gone on until the country is divided into provinces, whose traffic is controlled by five small groups of men. The several areas of control are indicated and the tendency toward further consolidation is discussed.

The new piercing plant of the Shelby Steel Tube Co. at Shelby, O., has been completed and will shortly be placed in operation. The building is of steel construction 70x200 feet.

3,000-POUND DOUBLE FRAME HAMMER.

The American Engineering Works, Chicago, have recently made additions to their shops and are now building double frame steam hammers, in addition to the single frame steam hammers they have been building for three years. The accompanying cut shows a 3,000-pound double frame hammer complete. This hammer is of a strong and substantial design and embraces all new features of known value. It is automatic double-acting, and readily operated by hand. The cylinder is cast from close grained gray iron and is provided with a balanced piston valve. The exhaust ports are so arranged as to keep the cylinder always drained. The throttle valve is under control of the operator. The steam valve is operated by a cam running on a beveled path formed on the back of the ram. The position of this cam is governed by a hand lever in the usual manner. The piston rod is a steel forging, forged solid with the piston head.



3,000-POUND DOUBLE FRAME HAMMER.

The frames are of a strong and substantial design, provided with adjustable V guides for ram, each guide being held to the frame by bolts well anchored in the frame. Frames are made of either cast iron or cast steel, as desired. The base is a heavy casting to which the frames are securely fastened. The ram is of solid steel, having cam paths solid therewith, and V grooves to match the guides in the frames. The upper die is a steel casting fastened to ram by dovetail and wedge. The lower die is a steel casting fitted to the anvil cap with dovetail and wedge. The lower die is made several inches longer than the upper die to provide a place for resting work on one end conveniently. An oil pump is provided to supply oil for valves and cylinder.

OBITUARY.

John D. Graff, manager of the Monongahela branch of the Pittsburg Stove & Range Co., Monongahela City, Pa., committed suicide at his home on Thursday, Jan. 27.

Col. James T. Griffin, one of the pioneer foreign representatives of American agricultural machinery, passed away in London, Eng., on Tuesday, Jan. 24. Deceased was 78 years of age and was born in Rochester, N. Y., of Scotch parentage. For ten years up to 1868, he was connected in this country and Europe with the business of C. H. McCormick & Bros. For 18 years thereafter he was the European and Colonial representative of the Walter A. Wood Mowing & Reaping Machine Co., of Hoosick Falls, N. Y. He was one of the founders of the Agricultural Association of Engineers in England, of which society he was also president for three years. He was also president of the Scottish Agricultural Engineer Society for a number of years.

News of the death of James S. Fruit at Chicago on Monday caused a good deal of regret among the members of the iron trade in Pennsylvania, Ohio and indeed throughout the country, for he was widely known. Mr. Fruit was collector of customs at Pittsburg, but his home was at Sharon, Pa., where he was in the wholesale hardware business, under the firm name of Fruit, Ohl & Co. He was a large stockholder in the Sharon Steel Co. He went to Chicago a short time ago and died there after an operation.

The Inland Steel Co will install a 10-inch bar mill at its Chicago Heights plant.

THE ORIGIN OF THE PREMIUM PLAN.

The *American Machinist* recently published an article upon the premium plan as adopted at the works of David Rowan & Co., Glasgow, Scotland. The author of this article claims certain features as original with himself and hence contrasts his system with the plan proposed by Mr. F. A. Halsey. The latter gentleman has contributed a demurrer to this action and as it clearly defines the fundamental characteristics of a system which seems destined to fill an important place in the unification of the interests of employer and employe we reprint Mr. Halsey's article:

"The public has little interest in the claims of individuals to personal credit, and it is with some hesitation that I refer to the statement in Mr. Rowan's excellent article published in another column that, 'so far as we have ever heard, this system is entirely novel and was unheard of before I introduced it myself.' In addition to the hesitation due to the fact that the public cares little for personal claims, is that due to the desire not to do anything which may seem to antagonize one who has done so much for the premium plan as has Mr. Rowan. So far as known, he has more men working under that plan than has any other man, firm or corporation, and he has been a center of light in this matter in Glasgow, and, indeed, in all Great Britain. Not to take the matter up, however, would in effect give tacit approval to his words, and as the subject is attracting wide attention, now is the time to set things right if that is to be done at all.

"Mr. Rowan is not to be criticized at all. He can hardly be expected to be familiar with the paper on 'The Premium Plan of Paying for Labor' which I read before the American Society of Mechanical Engineers ten years ago and which may be found in Volume XII. of the Transactions of that society. That paper began by classifying the various methods of paying for labor into:

"The day's-work plan,
"The piece-work plan,
"The profit-sharing plan,
"The premium plan.

"The salient features of these plans were outlined. The fundamental fault of the day's-work plan was stated to be that 'any increase of effort by the workman redounds solely to the benefit of the *employer*, the workman having no share in the consequent increase in production.' Similarly the fundamental fault of the piece-work plan was stated to b that 'any increase of effort by the workman redounds to *his own* benefit alone—the employer having no share in the consequent saving of time.' These objections were pointed out to be 'the exact antitheses of one another.' What was said about the profit-sharing plan is unimportant, as that plan has now largely dropped from public attention. The salient faults of the day's-work and piece-work plans having been given, the salient virtue of the premium plan was stated to be that it makes a 'division of the savings due to increased production between the employer and employe, but by a direct method instead of the circuitous one of the profit-sharing plan.' The 'essential principle' of the plan was thus described: 'The time required to do a given piece of work is determined from previous experience and the workman, in addition to his usual daily wages, is offered a premium for every hour by which he reduces that time on future work, the amount of the premium being less than his rate of wages. Making the hourly premium less than the hourly wages is the foundation stone on which rest all the merits of the system.' These features of the day's-work and piece-work plans were also described in my article published in the issue of this paper for March 9, 1899, from which the present interest in the subject dates, and it was stated that the premium plan 'in a sense splits the difference between the day's-work and piece-work plans.'

"Following this analysis of the different plans in the original paper, I gave the method which I had used in dividing the gains due to increased effort by the workman between the workman and his employer, as well as illustrations of the blank forms used. It would be just as unfair to limit my invention to the blank forms as to the exact method of division used. The statement of the basic idea is broad enough and clear enough, and there can be no doubt as to its meaning. The essence of the whole thing is the division of the gains between the workman and the employer, whereby, as has been described over and over again, wages go up and costs go down together.

"Mr. Rowan has suggested another method of making the division. Some time ago, in these columns, Mr. Fernstrom suggested another and Mr. Ross still another, and many others are possible. These gentlemen are entitled to the credit for what they have done, but that their methods of division constitute a new system or that their methods, and all similar methods which carry out the basic idea, are not included in the premium plan as invented by me, I deny. So long as the premium per hour saved is less than the wages per hour used, the system is my premium system and nothing else. If the premium rate equals the wages rate the system becomes, in effect, piece-work, and if the premium rate exceeds the wages rate it becomes, in effect, Mr. Taylor's differential piece-work system.

"The paper before the mechanical engineers contains, as far as I know, the first published use of the name and the first published description of the thing known as the premium plan. The invention is several years older than the paper, but the paper is the record.

"If I were to apply the language of the Patent Office to this unpatented and, perhaps unpatentable, invention, the result would be as follows:

"I claim:

"A plan of paying for labor in which the gains due to increased production by a workman are divided between the workman and his employer."

THE FORBES DIE STOCK.

To thread a pipe, of which but one end is exposed, at the bottom of a trench, is not the hard job it once was, since the introduction of the Forbes die stocks by the Curtis & Curtis Co., of Bridgeport, Conn. This machine is so powerful that one man operating it can cut off and thread a twelve-inch pipe. It is light and can be carried about like any other tool, and its compactness permits of its use in the most confined

places. The dies can be sharpened on the grindstone without first drawing the temper. The shell can be adjusted to take up the wear of the gear. For heavy work, the Curtis & Curtis Co. make power cutting and threading machines, in which the vise for holding the pipe is self-centering, and the dies may be adjusted to any variation of the fittings.

Good Blast Furnace Records.

In the month of January the No. 2 stack of the National Steel Co., at Youngstown, O., produced 19,645 tons of iron, or an average of nearly 634 tons per day. This is the best record made by any furnace in a month's operation up to date. This furnace some time ago broke all previous records for 24 hours' operation. This is a 600-ton stack, and the fact that it is producing more iron than estimated when erected speaks well for its operators and erectors.

The Hannah furnace of the Republic Iron & Steel Co., one of the oldest furnaces in the Valleys, and located at the Valley Works of the Republic Iron & Steel Co., Youngstown, O., broke its previous record in the month of January by turning out 9,945 tons. This was an average of 306 tons per day. The furnace was only designed for an output of about 250 tons daily. Credit is due B. Deetrick, the superintendent, for the excellent showing. The Laura furnace, operated by the same company at Haselton, O., broke all previous records on Wednesday, Jan. 26, by producing 392 tons of iron. The furnace was only designed for an output of 300 tons daily.

The Bessemer Coke Co., of Pittsburg, has published a blue print map of the Connellsville coke region, indicating particularly the location of the New Klondike operations.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

At New Castle, Pa., John Watson and others are figuring on the erection of a muck and skelp bar mill and a tube plant. Several local capitalists are reported to be interested.

The Eclipse Manufacturing & Plating Co., Birmingham, Ala., desires to correspond with firms that make patterns in iron for grates and frames, etc.

The Best-Scott Foundry Co. which will manufacture castings of all kinds, has been organized at Warren, Pa., with John Best as president, J. A. Viele, of New York, secretary and treasurer, and Robert Scott, manager. The company is placing contracts for machinery and expects to get the plant in operation in about two months.

The Standard Machine Co., Chattanooga, Tenn., is reported as contemplating the installation of additional machinery for increasing its capacity.

The directors of the Parkersburg Iron & Steel Co., of Pittsburg, whose sheet mills are located in Parkersburg, W. Va., elected the following officers: H. H. Neiman, president; A. H. Geilfuss, secretary; John F. Budke, vice-president and general manager; H. S. Duncan, vice-president and business manager; L. A. Myvel, treasurer; A. E. Neiman, assistant treasurer. The directors are G. Succop, Capt. W. H. Geilfuss, W. H. Paxton, Charles Geilfuss, Frank W. Budke, and A. P. Flowers, all of Pittsburg.

Stephens, Adamson & Co., Aurora, Ill., manufacturers of power transmission machinery, has been incorporated under the name Stephens-Adamson Manufacturing Co., with a capital stock of $35,000.

The Center Foundry & Machine Co. has been incorporated at Wheeling, W. Va., with a capital stock of $50,000.

The Newton Steel Wheel Co. has been organized at Kalamazoo, Mich. The company has quite a number of orders on hand and expects to begin operations February 1.

T. W. Coleman, Jr., Ross Blackmon, of Anniston; F. C. Mills and L. B. Miller, of Cleveland, have incorporated the Muscadine Mining Co., Anniston, Ala., with capital stock of $100,000, for developing iron-ore mines.

The National Tool & Machine Co. and the Central Foundry & Machine Co., Reading, Pa., have consolidated under the name of the latter firm. The plant of the National Co. will be combined with that of the Central Co., with some additions to the entire equipment. The capital stock has recently been increased from $7,000 to $18,000.

Edward L. Utley, Fayetteville, N. C., wants estimates on the equipment of a plant to cost between $3,000 and $4,000 for the manufacture of a new wrench. Specifications will be furnished on request.

The Liggett Pump Co. of Joplin, Mo., has been incorporated with a capital of $50,000, all paid in. C. E. Liggett, R. K. Pitkin and L. N. Dana are the incorporators.

The American Brass Foundry Co. of Hyde Park, Mass., has been incorporated with $7,000 capital. A. H. Brainard, R. P. Moseley, F. H. Ambach, Cyrus Gorham, John T. McCormick and James T. Scully are the incorporators.

The Montpelier Cup & Metal Works of Montpelier, Ind., has been incorporated with $30,000 capital by M. M. Page, A. P. Smith and R. J. Berry.

The William Bros Boiler & Mfg. Co. of Minneapolis, Minn., has been incorporated with $300,000 capital. William Bros has been elected president, Frederick Bros, vice-president, Joseph M. Bros, secretary and Bernard Bros, treasurer. The plant is now under erection.

The Johnston Harvester Co. of Batavia, N. Y., has increased its capital stock to $1,000,000 for the purpose of providing funds for an increase in the size of the plant. The sum of $100,000 will be spent on new buildings.

The Case Mfg. Co. of Rochester, N. Y., has been incorporated with $30,000 capital for the purpose of engaging in the manufacture of dies, machinery and tools. Charles V. Case, William Horschler and Frank E. Pulver are the incorporators.

The Chillicothe Steel Co. of Chillicothe, O., has been incorporated with $50,000 capital, of which $35,500 is paid in. John B. Hastings, G. H. Smith, William H. Hunter, F. M. Nichols, Charles Wissler and others are the incorporators.

The Thompson-Freeman Co. of Middleport, N. Y., has been incorporated to manufacture machinery. E. B. Freeman, George F. Thompson, M. D. Mack and L. S. Freeman are the incorporators.

The H. B. Sherman Mfg. Co. of Battle Creek, Mich., has purchased the plant of the Acme Brass Works, Elkhart, Ind. The tools and machinery of this plant are being removed to Battle Creek and will be installed in the Sherman plant.

The Hecla Charcoal Iron Co. of Ironton, O., has been incorporated to lease and operate the Hecla Furnace. E. J. Bird, Jr., S. B. Steece, George W. Keye, Charles Lintner, F. J. Horschel and H. C. Kerr are the incorporators.

The Port Huron Steel Screw Co. of Port Huron, Mich., has been incorporated with $10,000 capital for the manufacture of steel screws, shafting, etc. The new company has purchased the plant of the United States Drawn Steel Co. of Buffalo, N. Y.

The Townley Metal & Hardware Co. of Kansas City, Mo., has increased its capital stock from $100,000 to $500,000.

The Acme Metal Mfg. Co. of Chicago, Ill., has been incorporated with $20,000 capital. E. C. Moran, R. Otto and W. C. Peters are the incorporators.

The Sharp-Boulter Co. of Omaha, Neb., has been incorporated with $100,000 capital to erect and operate an iron foundry. L. C. Sharp and Charles L. Boulter are the incorporators.

The Des Moines Bridge & Iron Works of Des Moines, Ia., has increased its capital stock from $40,000 to $75,000.

The John Abell Engine Machine Co., Ltd., of Toronto, Ont., has been incorporated with $1,000,000 capital. S. C. Wood, R. Kilgour, C. Jones, H. P. Dwight, W. D. Mathews, W. R. Brock, A. W. Holmsted, J. Milne, T. A. Rowar, S. Barker and E. L. Gould are the incorporators.

The Greensburg Foundry & Machine Co. of Greensburg, Pa., has been incorporated with a capital of $10,000.

The American Foundry & Machine Co. of Cleveland, O., has been granted a Delaware charter with a capital of $200,000.

The Monitor Iron Co. of Mansfield, O., has been incorporated with a capital of $10,000.

The Meneffee Foundry Co. of Fort Wayne, Ind., has been incorporated with $20,000 capital to operate an iron foundry. C. M., O. F. and B. Meneffee are the incorporators.

The Pennsylvania Chain Co. has been organized at Harrisburg, Pa., with a capitalization of $50,000. The officers and directors are as follows: Gen. Thomas J. Stewart, president; Dr. A. I. Miller, vice-president; B. W. Demming, treasurer; C. D. Stucker, secretary and general manager. A site for the new plant has not yet been selected, but plans for an 80-fire plant have been prepared.

The Wilks Foundry Co. of Toledo, O., has been incorporated with a capital of $25,000. Charles P. Wilks, Thomas Davies, William E. Brown, George M. Kinsey and M. S. Riggs are the incorporators. The site for the foundry has not yet been selected.

New Construction:—

The Michigan Malleable Iron Co. at Delray, Mich., will shortly decide upon additions to be made to its plant, due to the large amount of business now on the books of the company.

The Olds Motor Co. at Lansing, Mich., will erect a new foundry, 70x200 feet.

M. H. Harrington will erect a chain plant at Philadelphia, Pa., 30x168 feet.

The Southern Car & Foundry Co. has decided to erect a large malleable foundry at Ensley, Ala., in conjunction with the steel car shops that are under construction at that place.

The Detroit Steel & Springs Co. of Detroit, Mich., will erect an addition to its foundry 75 feet square at a cost of $5,000.

Extensive improvements are to be made to the Bessemer plant of the Republic Iron & Steel Co. at Youngstown, O. The plant will practically be rebuilt and the daily output increased from 600 tons to 1,200 tons. The improvements will provide for the replacing of the blooming mill with a 40-

inch mill. The present tables will, however, be retained. The 5-ton converters will be replaced by 10-ton converters and an additional converter will be added to the four now in operation. A new stripper will also be installed. The heating furnaces will also be enlarged in conformity with the blooming mill. The enlarged plant will be necessary in the operations of the two new billet mills. The new billet mill will be ready for operation about March 1. It is not probable that these improvements will be made for some time as they will necessarily interfere with the operation of the plant to some extent. It is stated that the work will be completed within a year.

It is probable that the Cambria Steel Co. of Johnstown, Pa., will erect an additional blast furnace in order to keep up with the steel making capacity of the plant. The improvements made last year consisted of a 134-inch plate mill, six 50-ton open-hearth furnaces and a steel car plant.

The plant of the National Malleable Co., Toledo, O., is to be largely extended. Additional furnaces as well as larger molding floors will be provided.

The Hewitt Manufacturing Co., 21 Ontario street, Chicago, has purchased two and one-half acres of land at Emerald avenue and Fortieth street, on which it is proposed to erect a brass foundry at an estimated cost of $100,000. The building will be 250x150 feet, and it is expected, will be completed May 1.

The Lima Locomotive & Machine Co., Lima, O., has let the structural steel contract for its new machine and boiler shops, which will be 220x120 and 140x120 feet to the Champion Iron Co., Kenton, O. The Sprague Electric Co., Paterson, N. J., secured the contract for the electric work.

The Detroit Steel & Spring Co., Detroit, Mich., will add an addition to its foundry at Michigan and Scotten avenues, 75 feet square, one story.

Carroll Bros., Houghton, Mich., will build a foundry in the spring. All equipment has been purchased.

The Crescent works of the American Tin Plate Co., in Cleveland, will be enlarged and improved. An entirely new annealing and cold rolling department will be added. The five annealing furnaces now in use will be replaced by a single large furnace and the capacity of the finishing department will be largely increased. The work on the improvements will be started in about two weeks, and while it is under way the annealing and cold rolling departments of the works will be idle, throwing about 100 men out of employment.

The American Car & Foundry Co., Huntingdon, W. Va., lately reported as erecting buildings for increasing capacity, states that the only improvement being made is erection of a building 86x225 feet, in which to erect steel underframe cars.

The Chase Pump Co., Columbus, O., has had plans prepared for a foundry building to be erected at a cost of $15,000.

The G. L. Bollinger Co., structural engineers, of Pittsburg, will build a small structural plant at Verona, Pa., and contract for the shop, which will be 50x100 feet, has been let.

The Tyrone Foundry & Machine Co., Tyrone, Pa., is building an addition to its foundry.

L. P. Hacker, Abbeville, La., is building a machine shop and foundry, 25x52 feet.

The Pittsburg District:—

Goff, Horner & Co., Ltd., Pittsburg, with offices in the Lewis Building, have acquired an interest in the property of the Curtis Sheet Steel & Corrugating Co. of Zanesville, O., and will hereafter act in the capacity of sales agents. Four mills are in operation at present and the management is considering the advisability of adding a fifth mill. As almost the entire output of the plant in black sheets is sold several months in advance it is not probable that the galvanizing plant will be placed in operation for some time.

The Riter-Conley Mfg. Co. of Pittsburg has received a contract for the shipment of 30 steel tanks to Salvador. The firm has also received contracts for several petroleum tanks for shipment to the Hawaiian Islands.

The McClintic-Marshall Construction Co. of Pittsburg has been awarded the contract for the erection of the buildings for the new Standard Steel Car Co. The main building will be 1,622 feet long and 340 feet wide. In this building the steel cars will be built and erected. The adjoining building for the erection of wooden cars with steel underframes will be 552 feet long and 160 feet wide, while the paint shop will be 80x800 feet in size. The crane runways will also be erected by this company. About 2,500 tons of structural material will be required in the erection of the buildings. The capacity of the steel car plant will be about 45 cars daily, while the wooden car shop will have an output of 25 cars daily. Although not yet definitely announced it is understood that the plant will be located near Beaver, Pa.

The H. K. Porter Co. of Pittsburg, manufacturers of light locomotives purchased about $20,000 worth of property adjoining their present plant for extensions to their works.

The National Bridge Co. of Pittsburg has purchased 40 acres of land at Colonia, about 26 miles from Pittsburg, for the erection of an immense bridge plant the output of which will be about 6,000 tons of structural material per month. Plans for the buildings are now being prepared.

The Sterling Automatic Instantaneous Water Heater of Pittsburg will apply for a Pennsylvania charter on Feb. 18, with a capital of $5,000. A. J. Boucek, James Tracy, W. A. Bollinger, W. T. Sigmund and W. V. Moeller are the incorporators.

The Westinghouse Electric & Mfg. Co. of Pittsburg recently received the contract for the construction of a power plant for furnishing light and power for the World's Fair, to be held in St. Louis in 1903. The plant will generate about 10,667-h. p. and will cost $4,000,000. The power furnished by the Westinghouse plant will be about one-half of the total horsepower used by the fair, which will be 25,000-h. p. The remainder of the power will be furnished by the Citizens' Electric Light & Power Co. of St. Louis for a consideration of between $400,000 and $500,000. The plant of the Westinghouse company will be located in Machinery Hall on the exposition grounds and will generate light for 400,000 incandescent lamps and 2,000 arc lights. The plant when finished will be the largest single exhibit plant ever put into an exposition. The contract is for the plant complete, including boilers, engines, generators, foundations, piping, cooling towers, smoke-consuming devices, short stacks for mechanical drafts. The steam for the plant will be furnished through a tunnel from boilers located in a separate building 100 feet north of Machinery Hall.

Fires and Accidents:—

Fire in the Chandler & Price Co.'s machine shops, Cleveland, on Jan. 31, caused a loss of about $20,000.

The plant of the Empire Foundry Co., Troy, N. Y., was destroyed by fire last week. Loss, $30,000.

The Allston Iron Foundry, Allston, Mass., was damaged by fire to the extent of $10,000 last week.

The plant of the Rochester Machine & Screw Co., Rochester, N. Y., was almost completely destroyed by fire last week. Loss, $20,000.

As the result of an explosion at one of the furnaces of the Illinois Steel Co., South Chicago, Ill., last week, two workmen were killed and a number severely burned.

The plant of the Bettendorf Axle Co., Davenport, Ia., was damaged to the extent of $75,000 by fire last week.

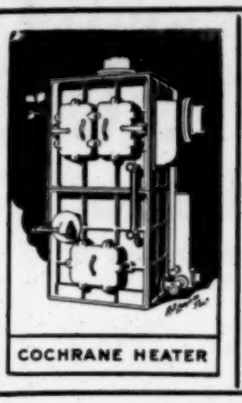
Fire partly destroyed the plant of the Dauchy Iron Works, 80 Illinois street, Chicago, last week.

General Industrial Notes:—

The Ohio Falls Iron Co., of New Albany, Ind., will put in a 20-inch muck mill and a 10-inch bar mill.

A. D. Meloy, of New York, and associates are investigating with a view to establishing iron furnace to utilize the ores of the Blue Ridge Iron Co., the Etowah mining property and other iron properties contiguous to Cartersville, Ga.

Torbett & Beckham, Monadnock building, Chicago, have recently purchased land and buildings at Hammond, Ind., from the American Sheet Steel Co. The buildings were formerly used by the Corning Steel Co., for the manufacture of sheets and were dismantled after coming into the hands of the American Sheet Steel Co., about two years ago, the machinery being removed last summer to other plants of the steel company. It is anticipated that the purchasers will use the buildings for the manufacture of cars.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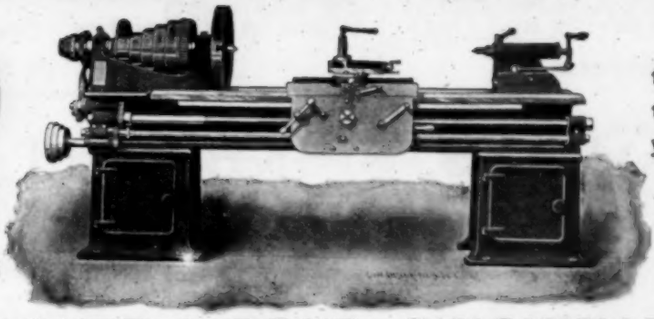

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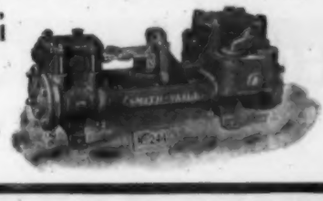

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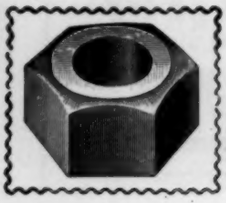

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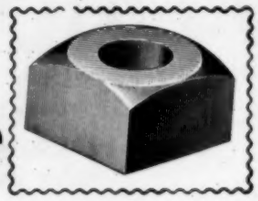

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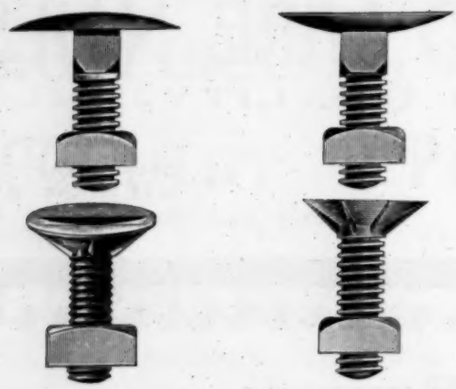

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